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THE SUMMIT FLORA OF MT. MURUD, SARAWAK, MALAYSIA

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INTRODUCTION

Mt. Murud, elev. 2,424 m, is the highest mountain in Sarawak. It is located on the boundary of the Limbang and Miri Divisions, in the Kelabit Highlands of northeastern Sarawak. The geology of Mt. Murud (as well as most of the Kelabit Highlands) is a white or yellowish sandstone of the Miocene Meligan Formation (Yin Ee Heng 1992). The long, narrow ridge constituting Mt. Murud proper, above 2,000 m, is about 4 km long, running in an ENE-WSW direction. The two highest points are fairly close together and nearly equal in elevation, the higher exceeding the lower by only 15 m. A panoramic view of the ridge is provided by Mjöberg (1925, Fig. 10), and a color photograph of Mt. Murud as seen from Batu Lawi is included in Plate 25 of Briggs (1988).

Since 1982 or earlier the Murud area has been proposed as a national park, but political considerations have not yet allowed that to happen. Until now the Kelabit Highlands have been one of the last remaining accessible but culturally and environmentally unspoiled areas in Sarawak; however, changes seem imminent. From the summit of Mt. Murud the sounds of a logging operation to the north are now within earshot. Bario, the largest settlement in the Kelabit Highlands, is getting a new airstrip, and a golf course and other tourist attractions have been proposed for the area. Bario featured prominently in Tom Harrisson's (1959) book, *World Within: A Borneo Story*, which chronicles the Australian penetration behind Japanese lines during World War II and gives a dramatic and intimate view of the Kelabit Highlands before they were affected by Western culture.

The first successful expedition to Mt. Murud was undertaken by the Swedish zoologist Eric Mjöberg, at that time Curator of the Sarawak Museum, who approached the mountain in October, 1922, and spent six days on its summit in early November. He made a large museum collection of animals in diverse groups and obtained a considerable number of herbarium specimens as well. Subsequently eight other botanical collectors or collecting teams have been to the summit.

Mjöberg (1925) published a detailed account of his 1922 expedition and a summary of previous exploration in the Kelabit Highlands. In discussing earlier expeditions he noted that the first attempt to explore Mt. Murud was initiated in 1914 by J. C. Moulton, then Curator of the Sarawak Museum. Moulton left on an expedition in October but returned on November 19; he noted that "failure was

due in the first place to the lack of food in the district, which prevented us obtaining sufficient natives for transport, and secondly to the alarming reports of a Dayak invasion which soon after our start robbed us of the few natives we had managed to get together" (Moulton 1915). Moulton made a second attempt to reach the mountain in 1920, but again failed.

THE MJÖBERG EXPEDITION

Mjöberg submitted his plan of exploration to Rajah Charles Vynar Brooke on July 13, 1922, and received immediate approval. He spent five weeks traveling up the Baram River and into the Kelabit Highlands, at some points with more than 70 porters and guides (his description of the personnel situation is somewhat ambiguous). He left for Baram Station (Marudi) on September 6, and, after various difficulties, arrived in the Kelabit region on October 5. He first saw Mt. Murud on October 10, about a two-hour hike before his party arrived at Pa Trap.

He persuaded seven local Kelabits to show him the route to the summit of Mt. Murud. As he tells it, they hacked a path for him climbing steadily upwards, often walking on undergrowth only hanging together by roots. On October 19, he reached the foot of Mt. Murud, and on November 2, "perhaps my most strenuous day during the whole journey," he climbed to the top ridge. His characterization of the summit follows: "We found ourselves in a strange landscape where low bushes with thick leathery leaves constituted the predominating vegetation. Here and there smaller trees were seen, among them a conifer with trunk and larger branches practically covered with the yellow blossoms of a small, richly flowering, epiphytic orchid. Bright scarlet or snow-white flowers of rhododendron and similar plants were met with everywhere; and most noticeable were the enormous and characteristically shaped pitchers of *Nepenthes lowii*, hitherto recorded only from Kinabalu and Batu Lawi." Mjöberg spent six days on the summit, until November 13. It should be noted that the labels of his botanical collections from the summit area bear the erroneous date of "October 1922." By November 27 he had returned to Pa Trap and departed the Kelabit Highlands on December 4; he arrived back at Baram Station on December 16 or 17.

In his book *Forest Life and Adventures in the Malay Archipelago*, Mjöberg (1930) gave an even more picturesque account of the summit than that quoted above, as follows. "I shall not soon forget the sight that met my eye when I succeeded, after tremendous exertions, in reaching the dim cloud-wreathed heights of the unexplored Mt. Murud. The whole of the vast forest was, as it were, illuminated by the newly opened orchids, which produced such a glory of colour that we could not turn our eyes away from all their beauty. Some of the trees were actually turned into pale yellow or mauve under their covering veil of orchids. From the boughs there hung in literal garlands the yard-long clusters of the flowering *Coelogyne*, and even the ground, which at other times is usually dull and bare, was now gay with the delicate plant-like orchids of the *Liparis* variety up to the *Spathoglottis*- and *Vanda*-like types that grow in bushes almost up to a man's head."

Mjöberg's expedition to Mt. Murud resulted in extensive collections of a wide range of plants and animals, many of which were published on by various authors in volume 3 of the *Sarawak Museum Journal* (1928). Most of his fern collections were reported on by Bonaparte (1923a). A few pteridophytes and the gymnosperms

and angiosperms were listed by Merrill (1928), who described 19 new species from the Murud collection (eight of which are no longer recognized). Merrill noted that he sent a first lot of orchids to Oakes Ames, and a second collection was sent directly by Mjöberg to Ames, but the Mjöberg orchids apparently were not reported upon. Jeffrey Wood of Kew has recently had on loan the Sarawak specimens of *Dendrochilum* from AMES, and none of four Mjöberg collections was annotated by Ames.

BOTANICAL COLLECTORS ON MT. MURUD

In addition to the Mjöberg expedition and our own field work, other botanical collectors who have visited the summit of Mt. Murud are as follows: B. L. Burtt of the Royal Botanic Garden, Edinburgh, with A. M. Martin, a plantsman from the Garden, collected there from September 26 to October 13, 1967. Their expedition was part of a joint activity with the Sarawak Forest Department, for which Ilias Paie was the principal collector. His collections from the summit area are dated from September 27 to October 13, 1967. Around October 10 he was joined briefly by J. A. R. Anderson, the Sarawak Forest Botanist, who had just come from Mt. Kinabalu, and independently left, exiting to Bario. Although the Burtt-Ilias expedition used the same camps and probably covered much of the same area, they worked independently, with Burtt and Martin concentrating on the shrub and herb flora and Ilias, with a team of climbers, concentrating on the trees. H. P. Nooteboom of the Rijksherbarium, Leiden, with Paul Chai of the Sarawak Forest Department, collected in the summit area from April 4–9, 1970; Yii Puan Ching of the Sarawak Forest Department collected on the summit ridge from September 10–13, 1982. Rena George and Rantai Jawa of the Sarawak Forest Department were on Mt. Murud between August 7 and 16, 1991, but we have seen only a few orchids collected by them; other collections they made probably are not yet processed. Jumaat Adam of Universiti Kebangsaan Malaysia was on Mt. Murud in 1994, but we have seen none of his collections. One Murud record of a collection by a Sarawak Museum Native Collector (*Diplazium porphyrorachis,* based on a report by Price, 1983) is recorded in the enumeration. We do not know when this collection was made.

Bonaparte (1923b) cited specimens of several species of ferns collected by J. C. Moulton from the summit and foot of Mt. Murud in December, 1914. Because Moulton (1915) indicated that his expedition did not reach Mt. Murud, these records appear to be in error. Furthermore, the numbers attributed by Bonaparte to Moulton do not agree with the numbering system otherwise used by Moulton. These specimens have not been included in the enumeration.

OUR TRIP TO MT. MURUD

Between April 10 and 23, 1995, a large component of the Universiti Malaysia Sarawak (UNIMAS) staff as well as scientists from other universities traveled to Bario, the largest settlement in the Kelabit Highlands, for the first major Bornean expedition sponsored by UNIMAS. The principal purpose of the expedition was to gather baseline information on various environmental aspects, including cultural, anthropological, and socio-economic values of the local communities, water quality, climate, geology, flora and fauna, and the river systems in the area.

Our trip to Mt. Murud was considerably more modest than Mjöberg's, starting with four botanists (one of whom left the group after the second day because of the rigors of the trail) and four porter-guides. We flew into Bario on a Malaysia Airlines Twin Otter rather than spending a month getting up the Baram River. We would agree with Mjöberg that attaining the summit of Mt. Murud requires "tremendous exertions," but along the summit ridge the path cleared by his guides over 70 years ago may have helped us. In any case, during the Confrontation there was a Gurkha post on the summit, with the remains of a hut still in evidence in 1967 (Burtt, pers. comm.). The helicopter fuel and other supplies they left behind were equitably shared by the local population of Kelabits and neighboring Indonesians. This travel undoubtedly helped impress a track into the summit ridge, and further clearing was done in 1967 by the team of B. L. Burtt and Ilias Paie. In more recent years the ridge-crest trail has become reasonably well worn as something of a "tourist" route.

We attended the Expedition Opening Ceremony in Bario on the morning of April 10, and, after feasting on a cow sacrificed for the occasion, found the local representative from Pa Lungan (3°48'32"N, 115°31'15"E), the kampung (village) furthest from Bario toward Mt. Murud, who took us through a soaking rain on a four-hour hike to his house for the evening. The next morning he arranged for our porter-guides and by 9 a.m. we were off, seeing no further signs of current civilization until we returned to Pa Lungan six days later. What a privilege it was, one we had never before experienced, to walk through unbroken primary forest (or in some cases old secondary forest) for six straight days, notwithstanding that we were rained on much of the time and constantly under attack by voracious leeches.

The first day's journey out of Pa Lungan took us over a fairly high ridge (Sekelun Hill, elev. ca. 1350 m, 3°50'42"N, 115°33'07"E) to Long Rapung (elev. ca. 1140 m, 3°51'54"N, 115°33'58"E), now a grove of giant bamboo [*Dendrocalamus asper* (Schult. f.) Backer ex K. Heyne, called *buluh betung* in Kelabit and Malay] on the Dapur River floodplain, but formerly a kampung that was evacuated during the Confrontation. Our night in the open shelter, constructed entirely of bamboo with rattan lashings, was comfortable except that we had to position ourselves to avoid the drips that continued with the all-night rain. By 9 o'clock the next morning we were underway again and were able to cross the Dapur River on a huge tree trunk that had been undercut by the river and fallen across it. We were hardly 15 minutes out of camp before one of the first exciting discoveries of the expedition was made, a large vine of a vanilla orchid (*Vanilla kinabaluensis* Carr), the first time it had been recorded in Sarawak. We marked the spot and left the plant to be collected on the return. In spite of the great size of the plant, we could find only one beautiful large yellow flower.

A slightly ridiculous nightly routine of the trip was the attempt to dry one's shoes and socks over the campfire. This was a particularly futile effort on the first day out of Long Rapung, because the Dapur River had to be crossed three more times (and the near-equal-sized Belaban River once), these crossings without the aid of a fallen tree, and it was not only shoes that were wet, but trousers up to the crotch or higher. These rivers were so swift and swollen by the recent heavy rains that our guides had to help us across.

The next day's journey brought us to the Belaban Camp (elev. ca. 1160 m), at the confluence of the Dapur and Belaban Rivers. Here there was no bamboo hut, but we were lucky to have a tent that developed only minor leaks during another night of constant rain. Our porter-guides made do (and stayed about as dry) with

a lean-to made of a large piece of nylon fabric suspended between two poles, and a ground-covering of bark pulled off the common tristania (*Tristaniopsis*) trees in strips 8 m long. Surely this campsite must be one of the most beautiful anyone has ever enjoyed, and, along with the soothing river sounds, came complete with a bath site on the mossy rocks of the Belaban.

The following day's hike was probably the easiest of the entire trip, requiring only three to four hours to the final base camp (elev. ca. 1775 m, known by the local people as Punang Pa Bermusuh) before the ascent of Mt. Murud. This day was less strenuous in part because there were no large rivers to ford, the climb was relatively gentle, going up a total of about 500 m, and there were not so many deep, slushy root-enclosed puddles as we had to slog through along the Dapur River floodplain on the previous days. Fortunately we arrived at this base camp early enough to get the tent and lean-to set up before the rain resumed (and continued all night). Tristania bark again provided the floor mat for the porter-guides. This camp served us two nights, the one before the final ascent and upon descent. We continued to marvel at how excellent a fire our porter-guides could build and maintain in spite of the firewood's being sopping wet. They achieved wonderful fires with the bamboo at Long Rapung, and with fresh green tristania wood at the other camps.

The next morning we left the base camp early, with the objective of getting to the summit as quickly as possible, which turned out to be nearly five hours later. The trail ascended steeply, first up through an oak-laurel lower montane forest, which then turned into a lower stature mossy forest just below the crest of the summit ridge at about 2,000 m (3°54'18"N, 115°30'50"E). We made it to this point in less than an hour, and initially thought that once on the ridge, the going would be easy. The actual situation was just the opposite. Along the ridge, the trail was deeply worn into tree roots and branches, and went up and down interminably with climbs and drops of 3–6 m, so that in 2.5 hours we had gained hardly more than 300 m in elevation through this spectacular dwarfed mossy elfin forest with the trees sometimes only 3–4 m high and rarely attaining more than 8 m. At about 11 a.m. we thought we were approaching the highest point along the ridge, but this was not actually reached until more than an hour later.

The final ascent to Mt. Murud's highest point (3°54'17"N, 115°29'19"E) was achieved without the soaking to which we had become accustomed, but we had been there less than half an hour when the rain started again. On reaching the summit we immediately began the collecting activities. After about an hour we started our way slowly back toward base camp (along that terrain one can only go slowly, but also to collect as much as possible along the summit ridge). The rain was incessant and hampered collecting, and the clouds obscured many of the beautiful views we should have been able to enjoy.

We continued collecting all the way back to the base camp, where we arrived just as it was getting dark. Had we not reached it before dark we would have had to spend the night in the open in the rain, because the trail was too difficult and dangerous to negotiate in darkness. Again it rained all night, but our tent provided some escape from the water.

One of the nicest discoveries of the journey was the vanilla plant noted above, but we were also able to document with a specimen the occurrence of *Rafflesia pricei* Meijer in Sarawak. This species was previously collected only from the Mt. Kinabalu area in Sabah (and more recently in Brunei). The plant was growing as a parasite on a huge *Tetrastigma* vine near the small stream Pa Parabao, about 45

minutes walking distance from Long Rapung toward Sekelun Hill. Another worthwhile discovery was the slipper orchid, *Paphiopedilum javanicum* var. *virens* (Rchb. f.) Stein, near the top of Sekelun Hill. In total our collections amounted to a little over 70 numbers. We arrived back in Bario just after midday on April 17, almost exactly one week after setting out on the trip.

METHODS

The enumeration provided below is incomplete but represents all collections reported by Bonaparte (1923a), Merrill (1928), our own collections, those encountered in the Sarawak Forest Department Herbarium (SAR), the Edinburgh Botanic Garden (E), the Royal Botanic Gardens, Kew (K), and the Rijksherbarium, Leiden (L). The nomenclature and taxonomic concepts applied by Bonaparte and Merrill have been updated to the extent possible without a detailed study of all the relevant material. The fern specimens Mjöberg submitted to Bonaparte are now in the herbarium of the Muséum National d'Histoire Naturelle, Paris (P). Merrill (1928) stated that types of the species he described based on the Mjöberg collections are in the Herbarium of the University of California (Berkeley) (UC). Presumably the first set of non-types is also deposited there, but he noted additionally that a set was deposited in the Natural History Museum, London (BM). The latter specimens have not been examined in the present study, but some Mjöberg collections, including isotypes, have been found in K.

The principal set of the Burtt and Martin collections is in E, with some duplicates in SAR. Burtt supplied to us the data for many of his collections and provided a loan of others that have been studied at K. The first set of Nooteboom and Chai collections is in L, and some duplicates have been found in K and SAR (a few specimens have been located in K that could not be found in L). The first set of Sarawak Forest Department collections is in SAR, with many duplicates in K and/or L. The specimens collected by Beaman and Anderson are deposited at UNIMAS, K, and MSC, with additional duplicates still to be distributed.

Only collections from above 1,500 m are included in the enumeration (therefore, the collections of *Vanilla*, *Rafflesia*, and *Paphiopedilum* noted above are not listed). For some specimens recorded from below that elevation it cannot be ascertained if the materials actually came from Mt. Murud or from nearby localities. The most interesting physiognomic and biogeographic aspects of the Murud flora are encountered above 1,500 m (mostly above 2,000 m), so this seems an appropriate lower limit. The elevation data provided by Bonaparte (1923a) and Merrill (1928) for Mjöberg collections are not in all cases readily convertible into a computer database, particularly when such statements as "at high altitudes" (e.g., *Carex cruciata*) and "from above an altitude of 1900 m" (e.g., *Rhododendron crassifolium*, reported as *R. murudense*), or elevations were given pertaining to two different mountains in Sarawak. Labels on the relevant Mjöberg specimens we have seen give the elevation as 1900 to 2400 m.

It might have been preferable to use 1800 m or 6000 ft as the lower boundary for collections to be included in this study, because this elevation more strictly defines the Mt. Murud summit ridge, whereas the 1500 m or 5000 ft contour extends rather widely from it. To choose the higher limit, however, would have resulted in excluding a number of Mjöberg collections we thought desirable to record. Future additions to the Murud summit flora might appropriately be limited

to the 1800 m contour and above. If one attempted to document the Murud flora by including species below 1500–1800 m, the mountain and its flora would become ill-defined.

Locality data provided by the different collectors have been variously expressed, making it necessary to standardize them. The latitude-longitude coordinates we recorded were obtained with a Magellan Trailblazer™ GPS unit, but this instrument could not always be used because of obstructing vegetation cover. Localities have been stated as precisely and briefly as possible, based on information provided by the labels. Sometimes this is no more precise than just "Mt. Murud," but if accompanied by an elevation figure, the locality becomes somewhat more precise. During the 1967 expedition of B. L. Burtt, A. M. Martin, and Ilias Paie five camps were used, of which Camps III, IV, and V were above 1500 m (5000 ft) and were along (not on the crest of) the summit ridge. Because many of their collections are located relative to these camps, the following information supplied by Burtt or interpreted from a map he provided is indicated in Table 1.

Achieving a complete set of determinations in a flora as poorly known as that of Mt. Murud and the rest of Borneo is a daunting task. For this project, as for many floristic efforts, the specimens are scattered in different herbaria and have had to be examined at different times, and have not all been seen. The enumeration therefore includes a rather high percentage of incompletely determined specimens and taxa named with varying levels of uncertainty. When the expression 'cf.' separates a generic name and specific epithet, this means that we think the specimens so identified might be a particular species but are uncertain of the identification; this is equivalent to putting a query (?) after the name. When the expression 'aff.' separates a generic name and specific epithet, it means that we are fairly sure that the taxon so identified is not the one named, but is allied to it. We have used the expression 'sp.' (or sp. 1, sp. 2) when we are unable to identify a specimen(s) but believe it (them) to be different from other taxa in the list. The expression 'indet.' has been used when material is undetermined or insufficiently studied.

The overall concept of a floristic enumeration of the type provided in this paper was outlined by Beaman and Regalado (1989) for the flora of Mt. Kinabalu in Sabah, Malaysia. An integrated system of computer programs used for data editing and printing enumerations (e.g., Parris et al. 1992; Wood et al. 1993; Beaman & Beaman 1993) was written in the dBASE IV programming language by Reed Beaman. These programs allow access to any aspect of the database through

TABLE 1. Locations of camps used during the expedition of B. L. Burtt, A. M. Martin, and the Sarawak Forest Department (Ilias Paie) in 1967.

Camp	*Elevation*	*Coordinates*	*Location*
I	4000 ft	?	Near the Komap River, ca. 4 km W of Ba Kelalan
II	3800 ft	3°58'N, 115°36'E	On the Bor River at Long Rapata, ca. 4.2 km SW of Camp I
III	5600 ft	3°56'N, 115°32'E	N side of the summit ridge, ca. 4.5 km S of Camp II
IV	6300 ft	3°56'N, 115°32'E	S side of the summit ridge, ca. 1.7 km W of Camp III
V	6800 ft	3°55'N, 115°31'E	S side of the summit ridge, ca. 4.2 km WSW of Camp IV

a menu system. Six principal relational data files were employed. Two of these contain data on specimens, including types. Taxonomic, nomenclatural, and bibliographic information is linked from other files. Menus facilitate entering and editing specimen and taxon data, globally replacing various expressions, such as changing an author's name or abbreviation, indexing and querying the database, computing a summary of elevation ranges for taxa, numbering taxa, making an index to numbered collections, and printing enumerations of all taxa in the database or of selected families or genera.

An earlier paper on the Murud summit flora by Beaman (1997) has been prepared, but that account was written before there was opportunity to record any of the specimens in E, L, and most of those that we have now been able to examine in K. The present enumeration is considerably more extensive than the previous account, but many species still may have been missed. It is also unfortunate that we have not been able to examine the Mjöberg collections in AMES, P, and UC, but at least those in P and UC have been listed by Bonaparte and Merrill.

PHYTOGEOGRAPHY

Mjöberg (1925) noted a strong biogeographic relationship between Mt. Murud and Mt. Kinabalu. He indicated that he "had not been working many days in the new field of exploration before I realized the great affinity between the famous fauna of Kinabalu and that of Mt. Murud situated more than a hundred miles farther south. Among the more conspicuous forms of life, the birds afforded clear evidence. Altogether I found nine birds more than one hundred miles farther south of their previously known home. To this we may add quite a number previously recorded only from Kinabalu and Mt. Dulit, and I feel confident that many more of what hitherto were considered exclusively Kinabalu birds would have been found not only on Mt. Murud but also in the intervening regions between Kinabalu and Mt. Murud and Mt. Dulit and even much farther south, proving that we have a continuous avifauna right through the central mountains of Borneo from Kinabalu in the north to Mt. Poi in the west and possibly with many forms south to the Müller and Schwaner Mountains."

Mt. Mulu (2377 m), 65 km WSW of Mt. Murud, is a close geographical neighbor and is only about 50 m lower. Considering their proximity and the fact that both mountains have a sandstone geology, one might expect a strong phytogeographic relationship, which our present data do not support. B. L. Burtt noted some years ago (unpubl. report) that Mt. Mulu is a different type of mountain, rising rapidly from 60 m to the summit. There is no area of surrounding highlands as at Mt. Murud, which would affect climatic conditions.

Gunung Mulu National Park was the subject of intensive botanical exploration in 1977–78 by the Royal Geographic Society and the Sarawak Government. During that time 115 scientists and assistants spent over 10,000 man-days in the Park (Jermy 1984). Various accounts based on this research have been published. A complete inventory of the Mulu flora was contemplated but has not appeared, although a preliminary list of angiosperms and gymnosperms was compiled by Anderson and Chai (1982). A comparison of the summit flora of Mt. Murud with the entire Mulu Park flora, an area of 52,864 ha embracing a great diversity of habitats from lowland peat-swamp forest, limestone outcrops, and kerangas vegetation, would not be meaningful.

Martin (1977) provided two tables listing common shrubs (Table 21) and miscellaneous collections (Table 22) from the summit of Mt. Mulu. These lists include just 33 taxa, of which 20 (61%) are common to Mt. Murud. We have examined the Mulu species lists for pteridophytes (Parris et al. 1984) and orchids (Wood 1984) to see how many species in these more detailed lists are common to the two mountains. In the case of fully determined pteridophytes, 19 taxa out of 31 total (61%) recorded from Mt. Murud are also recorded on Mt. Mulu. Among the orchids only 8 fully determined taxa out of 42 total (19%) from Mt. Murud are also recorded for Mt. Mulu.

Another mountain system about 150 km SW of Mt. Murud that could be considered for floristic comparison is Mt. Dulit in central Sarawak. The Dulit range, composed of Miocene limestone rising to an elevation of ca. 1460 m, was the subject of what must have been one of the most successful university student expeditions ever undertaken (Anonymous 1952). Notwithstanding that some 2,500 plants were collected (Harrisson 1933) and many papers subsequently published on the Dulit vegetation and flora, no list of species has been produced.

While identifying the plant collections from Mt. Murud and searching the herbaria for specimens from there, we have come to believe that each mountain in northern and central Sarawak has its own unique constellation of species. Apart from the studies of Mt. Mulu and Mt. Dulit, most other neighboring mountains have not been the subject of published reports, although many specimens have been accumulated that would permit the writing of florulas or development of computer databases.

One of the more intensively collected adjacent locations is Batu Lawi, twin columnar sandstone peaks only 12 km WSW of Mt. Murud. The summit of the higher peak apparently is still botanically unexplored. Some species are common to Mt. Murud and Batu Lawi, but frequently one notes that a species has been found on one mountain and not the other. Additionally, even with species common to the two areas, minor differences in the specimens are sometimes apparent. The first expedition to Batu Lawi was made by J. C. Moulton in 1911. His report (Moulton 1912) includes appendices by H. N. Ridley on general plant collections, by J. J. Smith on orchids, and by E. B. Copeland on ferns. Although of historical interest, especially because of the new species described, these accounts do not provide a satisfactory basis for a phytogeographic comparison of Batu Lawi with Mt. Murud. The Moulton expedition required about 2.5 months from Kuching and back, but only two days were spent around the base of Batu Lawi.

Sarawak Forest Department collectors have visited the Kelabit Highlands many times and assembled extensive collections from relatively high elevations in the Tama Abu Range, Apo Duat on the Indonesian border, Apad Keruma, Batu Buli, Batu Lawi, and other areas. The species that have been collected sometimes are represented in the Murud summit flora, but often they have not been found on Mt. Murud.

The most salient phytogeographic relationship of Mt. Murud appears to be with Mt. Kinabalu in northern Sabah. A major motivation for our trip to Mt. Murud was to obtain a personal view of similarities in the floras of these two mountains. The database we are preparing for a full enumeration of the flora of Mt. Kinabalu provides a basis for comparison, although, as with Mt. Mulu, comparing a summit flora with a far greater elevational range and edaphic diversity than that of Mt. Murud complicates the consideration. The Kinabalu database we have assembled includes species from elevations as low as about 300 m to the

summit at 4101 m. Likewise, Mt. Kinabalu has various geological substrates not found on Mt. Murud. Parris (1997) has recently reported on the phytogeography of Mt. Kinabalu pteridophytes, but she does not consider Mt. Murud per se, and the phytogeographical elements she recognizes, e.g., Borneo endemics and Sabah endemics, are too inclusive for use in the present analysis.

In the enumeration below, 260 fully determined taxa (i.e., those not listed as 'cf.', 'aff.' or 'sp.') can be used in a comparison with the Kinabalu flora. Of this number 184 taxa (71%) are common to Mt. Kinabalu and Mt. Murud. Many of the species are found in other localities as well, so it cannot be said that the Kinabalu-Murud relationship is unique. Nevertheless, the similarity of the flora of Mt. Murud to that of Mt. Kinabalu appears stronger than to the floras of Mt. Murud's geographically closer neighbors. As indicated above, only 61% of the Murud pteridophytes and 19% of the Murud orchids are also common to Mt. Mulu. In contrast, 24 pteridophyte taxa (77%) and 31 orchid taxa (74%) are common to Mt. Murud and Mt. Kinabalu (Kinabalu pteridophyte data from Parris et al., 1992; Kinabalu orchid data from Wood et al., 1993). The phytogeographic data thus support the observation of Mjöberg that there are strong similarities in the species composition of the biota of Mt. Murud and Mt. Kinabalu.

Among particularly interesting disjuncts between Mt. Kinabalu and Mt. Murud are *Centrolepis philippinensis* Merr., *Patersonia lowii* Stapf, and *Gentiana borneensis* Hook. f., taxa that occur at very high elevations on Mt. Kinabalu. Some of the more unusual discoveries in the Murud flora, including these three species, come from a basin on the north side a little below the summit in an area of extensive exposure of nearly bare sandstone. Noteworthy Murud disjunctions also occur in other directions, as for example *Oreobolus kükenthalii* Steenis, otherwise known only in northern Sumatra and the Malay Peninsula, and *Polygala oreotrephes* B. L. Burtt in the Malay Peninsula.

ENUMERATION

The enumeration includes 35 pteridophytes (5 fern allies and 30 ferns), 7 gymnosperms, 96 monocotyledons, and 207 dicotyledons. The total number of taxa is 345, representing 85 families and 173 genera, based on 945 specimen records from ca. 700 collections; 85 taxa (25%) are incompletely determined or determined with uncertainty. The Orchidaceae are the largest family, with 49 species and varieties, and the largest genus is *Rhododendron*, with about 18 species and varieties. Twenty-seven new taxa of vascular plants have been described from the Murud summit area, of which 16 are currently recognized.

FERN ALLIES

1. LYCOPODIACEAE

1.1. Huperzia

1.1.1. Huperzia phlegmaria (L.) Rothm. [listed by Merrill (1928) as *Urostachys phlegmaria* (L.) Herter].

Collections. Mt. Murud: *Mjöberg 73 p.p.* (UC); Mt. Murud ridge, SE side: 1700–2000 m, *Beaman 11489* (K, MSC, UNIMAS).

1.1.2. Huperzia serrata (Thunb. ex Murray) Trevis.

Collection. Mt. Murud between Camps II and III: 1500 m, *Burtt & Martin B. 5220* (E).

1.1.3. Huperzia verticillata (L. f.) Trevis. [listed by Merrill (1928) as *Urostachys verticillata* (L. f.) Herter].

Collections. Mt. Murud: 1900 m, *Mjöberg 73 p.p.* (UC); Mt. Murud, path to summit: 1700 m, *Nooteboom & Chai 1934* (L).

1.2. Lycopodiella

1.2.1. Lycopodiella cernua (L.) Pic. Serm.

Collection. Mt. Murud Camp IV: 1900 m, *Burtt & Martin B. 5385* (K).

2. SELAGINELLACEAE

2.1. Selaginella

2.1.1. Selaginella rugulosa Ces.

Collections. Mt. Murud Camp IV: 2000 m, *Burtt & Martin B. 5415* (K); Mt. Murud N of summit: 2100 m, *Burtt & Martin B. 5496* (K).

FERNS

3. ASPLENIACEAE

3.1. Asplenium

3.1.1. Asplenium nidus L. [listed by Bonaparte (1923a)].

Collection. Mt. Murud: 1500–1800 m, *Mjöberg 204 p.p.* (P).

4. BLECHNACEAE

4.1. Blechnum

4.1.1. Blechnum sp. [listed by Bonaparte (1923a) as *Blechnum capense* var. *procerum* f. *integrum* Bonap.].

Collection. Mt. Murud: 1500–1800 m, *Mjöberg 214* (P, holotype of *B. capense* var. *procerum* f. *integrum* Bonap.).

5. CYATHEACEAE

5.1. Cyathea

5.1.1. Cyathea capitata Copel. [listed by Bonaparte (1923a)].

Collections. Mt. Murud: 1500–1800 m, *Mjöberg 95* (P); Mt. Murud N side: *Burtt & Martin B. 5379* (E).

5.1.2. Cyathea indet.

Collection. Mt. Murud summit: 2400 m, *Nooteboom & Chai 2009* (L).

6. DENNSTAEDTIACEAE

6.1. Histiopteris

6.1.1. Histiopteris incisa (Thunb.) J. Sm. [listed by Bonaparte (1923a)].

Collection. Mt. Murud: 1500–1800 m, *Mjöberg 108* (P).

7. DIPTERIDACEAE

7.1. Dipteris

7.1.1. Dipteris conjugata Reinw. [listed by Bonaparte (1923a) as *D. conjugata* var. *alpina* Christ].

Collection. Mt. Murud summit: 2400 m, *Mjöberg s.n.* (P).

7.1.2. Dipteris lobbiana Moore

Collection. Mt. Murud: 1500–1800 m, *Mjöberg s.n.* (P) [doubtfully occurring as high as indicated, but so listed by Bonaparte (1923a)].

7.1.3. Dipteris novoguineensis Posth.

Collections. Mt. Murud: 2200 m, *Nooteboom & Chai 2039* (L); Mt. Murud N of summit: *Burtt & Martin B. 5472* (E).

7.1.4. Dipteris quinquefurcata Christ [listed by Bonaparte (1923a), but probably a form of the polymorphic *D. conjugata* Reinw.].

Collection. MT. MURUD: 1500–1800 m, *Mjöberg s.n.* (P).

8. DRYOPTERIDACEAE

8.1. DRYOPSIS

8.1.1. Dryopsis indet.

Collection. MT. MURUD, PATH TO SUMMIT: 1800 m, *Nooteboom & Chai 1960* (L).

9. GLEICHENIACEAE

9.1. GLEICHENIA

9.1.1. Gleichenia dicarpa R. Br.

Collections. MT. MURUD: 2300 m, *Nooteboom & Chai 2015* (L), 2400 m, *2036* (L); MT. MURUD N OF SUMMIT: 2100 m, *Burtt & Martin B. 5465B* (K).

9.1.2. Gleichenia peltophora Copel. var. **peltophora**

Collection. MT. MURUD N OF SUMMIT: 2100 m, *Burtt & Martin B. 5465A* (K).

9.2. STICHERUS

9.2.1. Sticherus hirtus (Blume) Ching var. **paleaceus** (Baker) Parris [listed by Bonaparte (1923a) as *Gleichenia hirta* Blume].

Collection. MT. MURUD: 1500–1800 m, *Mjöberg s.n.* (P).

10. GRAMMITIDACEAE

10.1. CTENOPTERIS

10.1.1. Ctenopteris taxodioides (Baker) Copel. [listed by Bonaparte (1923a) and Merrill (1928) as *Polypodium taxodioides* Baker].

Collections. MT. MURUD: 2400 m, *Mjöberg 7* (K), *70* (UC), 1500–1800 m, *256* (P).

10.2. PROSAPTIA

10.2.1. Prosaptia contigua (G. Forst.) C. Presl [listed by Bonaparte (1923a) as *Davallia contigua* (G. Forst.) J. Sm.].

Collections. MT. MURUD: 1500–1800 m, *Mjöberg s.n.* (P); MT. MURUD SUMMIT: 2400 m, *Mjöberg s.n.* (P).

10.3. Scleroglossum

10.3.1. Scleroglossum minus (Fée) C. Chr.

Collection. Mt. Murud near Camp V: 2100 m, *Burtt & Martin B. 5444* (E).

11. HYMENOPHYLLACEAE

11.1. Macroglena

11.1.1. Macroglena meifolia (Bory ex Willd.) Copel. [listed by Merrill (1928) as *Trichomanes pluma* Hook.].

Collections. Mt. Murud: above 1200 m, *Mjöberg 67* (UC), 2300 m, *Nooteboom & Chai 2014* (L).

11.1.2. Macroglena schlechteri (Brause) Copel.

Collection. Mt. Murud: 2100 m, *Burtt & Martin B. 5356* (K).

11.2. Pleuromanes

11.2.1. Pleuromanes album (Blume) Parris

Collection. Mt. Murud: 1900 m, *Burtt & Martin B. 5392* (E).

12. OLEANDRACEAE

12.1. Oleandra

12.1.1. Oleandra neriiformis Cav. [listed by Bonaparte (1923a)].

Collection. Mt. Murud: 1500–1800 m, *Mjöberg 182* (P).

13. PLAGIOGYRIACEAE

13.1. Plagiogyria

13.1.1. Plagiogyria egenolfioides (Baker) Copel. var. **latipinna** (Copel.) Zhang & Noot.

Collection. Mt. Murud, path to summit: 1800 m, *Nooteboom & Chai 1945* (L).

13.1.2. Plagiogyria pycnophylla (Kunze) Mett. [listed by Bonaparte (1923a)].

Collection. Mt. Murud: 1500–1800 m, *Mjöberg 22* (P, holotype of *P. pycnophylla* var. *integra* subvar. *stenophylla* Bonap.).

13.1.3. Plagiogyria tuberculata Copel. [listed by Bonaparte (1923a) as *P. rotundipinnata* Bonap.].

Collections. Mt. Murud: 2400 m, *Mjöberg s.n.* (P, holotype of *P. rotundipinnata* Bonap.); Mt. Murud N of summit: *Burtt & Martin B. 5474* (E).

14. POLYPODIACEAE

14.1. Selliguea

14.1.1. Selliguea albidosquamata (Blume) Parris [listed by Bonaparte (1923a) and Merrill (1928) as *Polypodium albidosquamatum* Blume].

Collection. Mt. Murud: 1900 m, *Mjöberg 71* (UC).

14.1.2. Selliguea enervis (Cav.) Ching [listed by Merrill (1928) as *Polypodium triquetrum* Blume].

Collection. Mt. Murud: *Mjöberg 68* (UC).

15. SCHIZAEACEAE

15.1. Schizaea

15.1.1. Schizaea malaccana Baker var. **malaccana**

Collections. Mt. Murud N side: 2100 m, *Burtt & Martin B. 5483* (K); Mt. Murud summit: 2400 m, *Nooteboom & Chai 2064* (L).

16. THELYPTERIDACEAE

16.1. Coryphopteris

16.1.1. Coryphopteris pubirachis (Baker) Holttum var. **sulawesica** Holttum

Collection. Mt. Murud N of summit: *Burtt & Martin B. 5462* (E).

16.1.2. Coryphopteris viscosa (Baker) Holttum

Collection. Mt. Murud summit ridge: *Burtt & Martin B. 5488* (E).

17. VITTARIACEAE

17.1. Vittaria

17.1.1. Vittaria indet.

Collection. Mt. Murud: 2200 m, *Nooteboom & Chai 2028a* (L).

18. WOODSIACEAE

18.1. Diplazium

18.1.1. Diplazium porphyrorachis (Baker) Diels

Collection. Mt. Murud: *Sarawak Museum Native Collector 2937* (PNH) [fide M. G. Price, Gard. Bull. Singapore 36: 29 (1983)].

GYMNOSPERMS

19. ARAUCARIACEAE

19.1. Agathis

19.1.1. Agathis kinabaluensis de Laub.

Collections. Mt. Murud between 1st and 2nd summits: 2300 m, *Yii S. 44461* (K); Mt. Murud just below summit: 2400 m, *Nooteboom & Chai 2013* (K, L); Mt. Murud summit ridge: 2300–2400 m, *Beaman 11464* (K, MSC, UNIMAS).

20. PHYLLOCLADACEAE

20.1. Phyllocladus

20.1.1. Phyllocladus hypophyllus Hook. f.

Collections. Mt. Murud Camp IV: 2000 m, *Burtt & Martin B. 5437* (E); Mt. Murud summit ridge: 2300–2400 m, *Beaman 11466* (K).

21. PODOCARPACEAE

21.1. Dacrycarpus

21.1.1. Dacrycarpus imbricatus (Blume) de Laub. [listed by Merrill (1928) as *Podocarpus javanicus* (Burm. f.) Merr.].

Collection. Mt. Murud: 1500 m, *Mjöberg 99* (UC).

21.2. Dacrydium

21.2.1. Dacrydium beccarii Parl. in DC. [listed by Merrill (1928)].

Collection. Mt. Murud: 1200 m, *Mjöberg 100* (UC).

21.2.2. Dacrydium gibbsiae Stapf

Collections. Mt. Murud near summit: 2100 m, *Ilias S. 26505* (K); Mt. Murud summit: 2400 m, *Anderson & Ilias S. 26471* (K); Mt. Murud summit ridge: 2300–2400 m, *Beaman 11440* (K, MSC, UNIMAS).

21.2.3. Dacrydium xanthandrum Pilger

Collections. Mt. Murud between 1st and 2nd summits: 2200 m, *Yii S. 44608* (K); Mt. Murud summit ridge: 2300–2400 m, *Beaman 11487* (K, MSC, UNIMAS).

21.3. Podocarpus

21.3.1. Podocarpus neriifolius D. Don

Collection. Mt. Murud summit ridge: 2300–2400 m, *Beaman 11480* (K, UNIMAS).

ANGIOSPERMS: MONOCOTYLEDONS

22. ARACEAE

22.1. Scindapsus

22.1.1. Scindapsus borneensis Engl.

Collection. Mt. Murud, path to summit: 1700 m, *Nooteboom & Chai 1937* (B, L, US).

23. ARECACEAE

23.1. Calamus

23.1.1. Calamus gibbsianus Becc.

Collections. Mt. Murud summit: 2400 m, *Nooteboom & Chai 1998* (L); Mt. Murud summit ridge: 2300–2400 m, *Beaman 11471* (K, UNIMAS).

23.1.2. Calamus mattanensis Becc. [listed by Merrill (1928) as *C. ferrugineus* Becc., a synonym fide Dransfield (1992)].

Collection. Mt. Murud: 1900 m, *Mjöberg 126* (UC).

23.1.3. Calamus pilosellus Becc. [listed by Merrill (1928); not recorded by Dransfield (1992) as occurring in the Kelabit Highlands].

Collection. Mt. Murud: 1900 m, *Mjöberg 128* (UC).

23.2. Pinanga

23.2.1. Pinanga capitata Becc.

Collection. Mt. Murud 2nd summit: 2300 m, *Yii S. 44442* (K, L).

24. CENTROLEPIDACEAE

24.1. Centrolepis

24.1.1. Centrolepis philippinensis Merr.

Collection. Mt. Murud N side: 2100 m, *Burtt & Martin B. 5494* (E).

25. CYPERACEAE

25.1. Carex

25.1.1. Carex cruciata Wahl. [listed by Merrill (1928)].

Collection. Mt. Murud: *Mjöberg 113* (UC).

25.1.2. Carex filicina Nees

Collection. Mt. Murud, ridge above Camp IV: 2000 m, *Burtt & Martin B. 5383* (E).

25.1.3. Carex sp. (sect. *Mitratae*)

Collection. Mt. Murud summit: 2400 m, *Nooteboom & Chai 2030* (L).

25.2. Gahnia

25.2.1. Gahnia javanica Zoll. & Moritzi ex Moritzi

Collections. Mt. Murud Camp V: 2100–2300 m, *Burtt & Martin B. 5475* (E); Mt. Murud summit: 2400 m, *Nooteboom & Chai 1981* (L); Mt. Murud summit ridge: 2300–2400 m, *Beaman 11465* (K, MSC, UNIMAS).

25.3. Oreobolus

25.3.1. Oreobolus kükenthalii Steenis

Collections. Mt. Murud Camp V: 2100–2300 m, *Burtt & Martin B. 5482* (E, L); Mt. Murud summit: 2400 m, *Nooteboom & Chai 2023* (L).

26. IRIDACEAE

26.1. Patersonia

26.1.1. Patersonia lowii Stapf

Collections. Mt. Murud: 2200 m, *Nooteboom & Chai 2025* (L); Mt. Murud between Camp V and summit: 2300 m, *Burtt & Martin B. 5455* (E).

27. MELANTHIACEAE

27.1. Petrosavia

27.1.1. Petrosavia stellaris Becc.

Collection. Mt. Murud near Camp III: 1800 m, *Burtt & Martin B. 5277* (E).

28. ORCHIDACEAE

28.1. Appendicula

28.1.1. Appendicula bilobulata J. J. Wood

Collection. Mt. Murud near Camp III: 1800 m, *Burtt & Martin B. 5287* (E, holotype of *A. bilobulata*; SAR, isotype).

28.1.2. Appendicula congesta Ridl.

Collection. MT. MURUD CAMP III: 1700 m, *Burtt & Martin B. 5233* (E, SAR).

28.1.3. Appendicula foliosa Ames & C. Schweinf.

Collection. MT. MURUD: 1600 m, *Yii S. 44421* (K).

28.1.4. Appendicula longirostrata Ames & C. Schweinf.

Collection. MT. MURUD ABOVE CAMP IV: 2000 m, *Burtt & Martin B. 5434* (E, SAR).

28.1.5. Appendicula indet.

Collections. MT. MURUD: 1600 m, *Yii S. 44401* (K); MT. MURUD, PATH TO SUMMIT: 1700 m, *Nooteboom & Chai 1922* (L).

28.2. BROMHEADIA

28.2.1. Bromheadia crassiflora J. J. Sm.

Collections. MT. MURUD: 2200 m, *Nooteboom & Chai 2054* (L); MT. MURUD N SIDE: 2100 m, *Burtt & Martin B. 5463A* (SAR); MT. MURUD BETWEEN 1ST AND 2ND SUMMITS: 2300 m, *Yii S. 44482* (L, SAR).

28.3. BULBOPHYLLUM

28.3.1. Bulbophyllum anguliferum Ames & C. Schweinf.

Collection. MT. MURUD CAMP III: 2000 m, *Burtt & Martin B. 5252* (E).

28.3.2. Bulbophyllum sopoetanense Schltr.

Collection. MT. MURUD NEAR CAMP IV: 1900 m, *Burtt & Martin B. 5404* (E, SAR).

28.3.3. Bulbophyllum aff. **teres** Carr

Collection. MT. MURUD ABOVE CAMP III: 1800 m, *Burtt & Martin B. 5262* (E).

28.4. CALANTHE

28.4.1. Calanthe speciosa (Blume) Lindl.

Collections. MT. MURUD: 1800 m, *Nooteboom & Chai 1969* (L, SAR); MT. MURUD NEAR CAMP III: 1800 m, *Burtt & Martin B. 5271* (E, SAR).

28.4.2. Calanthe tenuis Ames & C. Schweinf.

Collections. MT. MURUD ABOVE CAMP IV: 2000 m, *Burtt & Martin B. 5352* (E); MT. MURUD BELOW CAMP IV: 1800 m, *Burtt & Martin B. 5368* (E, SAR).

28.4.3. Calanthe indet.

Collections. MT. MURUD: 1700 m, *Nooteboom & Chai 1910* (L), 1800 m, *1969* (L).

28.5. CHELONISTELE

28.5.1. Chelonistele lamellulifera Carr

Collection. MT. MURUD NEAR CAMP III: 1800 m, *Burtt & Martin B. 5272* (E, SAR).

28.6. COELOGYNE

28.6.1. Coelogyne craticulaelabris Carr

Collection. MT. MURUD N SIDE: 2300 m, *Burtt & Martin B. 5454* (E, SAR).

28.6.2. Coelogyne hirtella J. J. Sm.

Collections. MT. MURUD: 2200 m, *Nooteboom & Chai 2019* (SAR); MT. MURUD CAMP III: 1800 m, *Burtt & Martin B. 5256* (E).

28.6.3. Coelogyne kinabaluensis Ames & C. Schweinf.

Collection. MT. MURUD CAMP III: 1700 m, *Burtt & Martin B. 5236* (E).

28.6.4. Coelogyne moultonii J. J. Sm.

Collections. MT. MURUD CAMP III: 1600 m, *Burtt & Martin B. 5258* (SAR); MT. MURUD NEAR CAMP III: 1600 m, *Burtt & Martin B. 5258* (E).

28.6.5. Coelogyne planiscapa Carr var. **planiscapa**

Collection. MT. MURUD CAMP III: 1700 m, *Burtt & Martin B. 5243* (E).

28.6.6. Coelogyne radioferens Ames & C. Schweinf.

Collections. MT. MURUD NEAR CAMPS III AND IV: 1800–2000 m, *Burtt & Martin B. 5274* (E, SAR); MT. MURUD/DAPUR RIVER: 1900 m, *Ilias S. 26519* (SAR).

28.6.7. Coelogyne tenompokensis Carr

Collection. MT. MURUD CAMP III: 1700 m, *Burtt & Martin B. 5245* (E, SAR).

28.6.8. Coelogyne indet.

Collections. MT. MURUD: 2200–2300 m, *Nooteboom & Chai 2055* (L); MT. MURUD/BA KELALAN: 1700 m, *Burtt & Martin B. 5247* (SAR).

28.7. CYMBIDIUM

28.7.1. Cymbidium elongatum J. J. Wood, Du Puy & Shim

Collections. MT. MURUD CAMP V: 2100–2300 m, *Burtt & Martin B. 5460* (E, SAR); MT. MURUD ABOVE CAMP IV: 2000 m, *Burtt & Martin B. 5428* (E, SAR).

28.8. DENDROBIUM

28.8.1. **Dendrobium alabense** J. J. Wood

Collections. MT. MURUD N SIDE: 2100 m, *Burtt & Martin B. 5480* (E); MT. MURUD ABOVE CAMP IV: 1600 m, *Burtt & Martin B. 5354* (E).

28.8.2. **Dendrobium cymbulipes** J. J. Sm.

Collection. MT. MURUD NEAR CAMP III: 1800 m, *Burtt & Martin B. 5333* (E).

28.8.3. **Dendrobium piranha** C. L. Chan & P. Cribb

Collection. MT. MURUD: 2200 m, *Nooteboom & Chai 2032* (L, SAR).

28.8.4. **Dendrobium** sp. (sect. *Rhopalanthe*)

Collection. MT. MURUD SUMMIT RIDGE: 2300–2400 m, *Beaman 11482* (K).

28.8.5. **Dendrobium** indet.

Collection. MT. MURUD: 2200 m, *Nooteboom & Chai 2033* (L).

28.9. DENDROCHILUM

28.9.1. **Dendrochilum crassifolium** Ames

Collections. MT. MURUD: 2400 m, *Nooteboom & Chai 1995A* (L); MT. MURUD CAMP III: 1700 m, *Burtt & Martin B. 5241* (E, K, SAR); MT. MURUD SW OF CAMP III: 1800 m, *Burtt & Martin B. 5319* (E).

28.9.2. **Dendrochilum dewindtianum** W. W. Sm. var. **dewindtianum**

Collection. MT. MURUD SUMMIT RIDGE: 2300–2400 m, *Beaman 11448* (K, MSC, UNIMAS).

28.9.3. **Dendrochilum galbanum** J. J. Wood

Collections. MT. MURUD 2ND SUMMIT: 2300 m, *Yii S. 44430* (K, SAR); MT. MURUD SW OF CAMP III: *Burtt & Martin B. 5328* (E, K).

28.9.4. **Dendrochilum gibbsiae** Rolfe

Collections. MT. MURUD: 1600 m, *Yii S. 44402* (K); MT. MURUD BELOW CAMP III: 1600 m, *Burtt & Martin B. 5299* (E, SAR).

28.9.5. **Dendrochilum imbricatum** Ames

Collection. MT. MURUD: 1900–2400 m, *Mjöberg 64* (AMES).

28.9.6. Dendrochilum lancilabium Ames

Collections. Mt. Murud: 2100 m, *Ilias S. 26455* (E, K, L), 1900–2400 m, *Mjöberg 52* (AMES); Mt. Murud SW of Camp III: 1800 m, *Burtt & Martin B. 5319* (E).

28.9.7. Dendrochilum longipes J. J. Sm.

Collections. Mt. Murud: 1900–2400 m, *Mjöberg 66* (AMES); Mt. Murud 2nd summit: 2300 m, *Yii S. 44432* (K, L, SING); Mt. Murud near Camp IV: 1900 m, *Burtt & Martin B. 5399* (E); Mt. Murud, path to summit: 1800 m, *Nooteboom & Chai 1954* (L).

28.9.8. Dendrochilum muluense J. J. Wood

Collections. Mt. Murud Camp III: 1700 m, *Burtt & Martin B. 5244* (E, SAR); Mt. Murud between 1st and 2nd summits: 2200 m, *Yii S. 44616* (K).

28.9.9. Dendrochilum murudense (J. J. Wood) J. J. Wood

Collections. Mt. Murud: 2400 m, *Nooteboom & Chai 1995* (K, holotype of *D. crassifolium* var. *murudense* J. J. Wood); Mt. Murud summit ridge: 2300–2400 m, *Beaman 11459* (K, UNIMAS).

28.9.10. Dendrochilum simplex J. J. Sm.

Collection. Mt. Murud: 1900–2400 m, *Mjöberg 49* (AMES).

28.10. Dilochia

28.10.1. Dilochia cantleyi (Hook. f.) Ridl.

Collections. Mt. Murud: 1700 m, *Yii S. 44627* (K); Mt. Murud N side near Camp V: 2100 m, *Burtt & Martin B. 5443* (E, SAR); Mt. Murud, Dapur River headwaters: 2400 m, *Ilias S. 26539* (K).

28.10.2. Dilochia rigida (Ridl.) J. J. Wood

Collections. Mt. Murud 2nd summit: 2200 m, *Ilias S. 26408* (K); Mt. Murud between 1st and 2nd summits: 2300 m, *Yii S. 44486* (K, SAR); Mt. Murud summit ridge: 2300–2400 m, *Beaman 11455* (K); Mt. Murud, Dapur River headwaters: 2400 m, *Ilias S. 26538* (K).

28.11. Epigeneium

28.11.1. Epigeneium indet.

Collection. Mt. Murud: 2200–2300 m, *Nooteboom & Chai 2044* (L).

28.12. Eria

28.12.1. Eria aff. **brookesii** Ridl.

Collections. Mt. Murud Camp III: 1700 m, *Burtt & Martin B. 5231* (E, SAR); Mt. Murud SW of Camp III: 1800 m, *Burtt & Martin B. 5327* (E, SAR).

28.12.2. Eria crassipes Ridl.

Collections. Mt. Murud: 2400 m, *Nooteboom & Chai 2065* (SAR), 2300 m, *Yii S. 44431* (K).

28.12.3. Eria robusta (Blume) Lindl.

Collections. Mt. Murud N side: 2100 m, *Burtt & Martin B. 5466* (E); Mt. Murud above Camp III: 1800 m, *Burtt & Martin B. 5263* (E); Mt. Murud between 1st and 2nd summits: 2300 m, *Yii S. 44491* (K); Mt. Murud summit ridge: 2300–2400 m, *Beaman 11485* (K, MSC, UNIMAS).

28.12.4. Eria indet.

Collections. Mt. Murud: 1700 m, *Rena, Rantai et al. S. 60336* (K); Mt. Murud, path to summit: 1700 m, *Nooteboom & Chai 1927* (L).

28.13. Liparis

28.13.1. Liparis compressa (Blume) Lindl. var. **compressa**

Collection. Mt. Murud: 1700 m, *Rena, Rantai et al. S. 60335* (K).

28.13.2. Liparis pandurata Ames

Collection. Mt. Murud Camp III: 1700 m, *Burtt & Martin B. 5237* (E, SAR).

28.14. Nabaluia

28.14.1. Nabaluia exaltata de Vogel

Collections. Mt. Murud: 2100 m, *Ilias S. 26466* (K), 2400 m, *Rena, Rantai et al. S. 60394* (K); Mt. Murud Camp III: 1600 m, *Burtt & Martin B. 5260* (E); Mt. Murud above Camp III: 1800 m, *Burtt & Martin B. 5259* (E, SAR).

28.15. Oberonia

28.15.1. Oberonia aff. **griffithiana** Lindl.

Collection. Mt. Murud near Camp IV: 1900 m, *Burtt & Martin B. 5393* (E).

28.16. Phaius

28.16.1. Phaius aff. **pauciflorus** (Blume) Blume

Collection. Mt. Murud near Camp III: 1800 m, *Burtt & Martin B. 5329* (E, SAR).

28.17. Pholidota

28.17.1. Pholidota gibbosa (Blume) de Vriese

Collections. Mt. Murud Camp III: 1800 m, *Burtt & Martin B. 5269* (E); Mt. Murud Camp IV: 1900 m, *Burtt & Martin B. 5390* (SAR).

28.17.2. Pholidota mediocris de Vogel

Collection. Mt. Murud near Camp III: 1800 m, *Burtt & Martin B. 5338* (E).

28.18. Trichotosia

28.18.1. Trichotosia cf. **annulata** Blume

Collection. Mt. Murud/Belaban River headwaters: 1700 m, *Ilias S. 26353* (K).

28.18.2. Trichotosia aff. **ferox** Blume

Collection. Mt. Murud N side: 2100 m, *Burtt & Martin B. 5464* (E).

28.18.3. Trichotosia poculata (Ridl.) Kraenzl.

Collection. Mt. Murud, path to summit: 1800 m, *Nooteboom & Chai 1946* (L, SAR).

28.18.4. Trichotosia sarawakensis Carr

Collections. Mt. Murud Camp III: 1700 m, *Burtt & Martin B. 5229* (E, SAR), 1700 m, *B. 5230* (E, SAR).

29. PANDANACEAE

29.1. Freycinetia

29.1.1. Freycinetia kinabaluana B. C. Stone

Collection. Mt. Murud, path to summit: 1700 m, *Nooteboom & Chai 1939* (L).

29.1.2. Freycinetia rigidifolia Hemsl.

Collection. Mt. Murud/Belaban River: 1700 m, *Ilias S. 26337* (K, L).

29.2. Pandanus

29.2.1. Pandanus papilio B. C. Stone

Collection. Mt. Murud Camp IV: 2000 m, *Burtt & Martin B. 5431* (E).

30. PHORMIACEAE

30.1. Dianella

30.1.1. Dianella ensifolia (L.) DC. [listed by Merrill (1928)].

Collections. Mt. Murud: 1500 m, *Mjöberg 123* (UC), 2200 m, *Nooteboom & Chai 2026* (L).

30.1.2. Dianella javanica (Blume) Kunth

Collection. Mt. Murud summit: 2400 m, *Nooteboom & Chai 1999* (L).

31. POACEAE

31.1. Isachne

31.1.1. Isachne kinabaluensis Merr.

Collections. Mt. Murud N side: 2100 m, *Burtt & Martin B. 5463* (E); Mt. Murud summit: 2400 m, *Nooteboom & Chai 2029* (L).

31.2. Racemobambos

31.2.1. Racemobambos glabra Holttum

Collection. Mt. Murud N side: 2100 m, *Burtt & Martin B. 5495* (E).

32. SMILACACEAE

32.1. Smilax

32.1.1. Smilax lanceifolia Roxb.

Collections. Mt. Murud: 2400 m, *Nooteboom & Chai 1987* (K); Mt. Murud N side: 2300 m, *Burtt & Martin B. 5453* (E); Mt. Murud/Belaban River: 1700 m, *Ilias S. 26332* (K).

32.1.2. Smilax sp. 1

Collection. Mt. Murud, path to summit: 1700 m, *Nooteboom & Chai 1906* (L).

32.1.3. Smilax sp. 2

Collection. Mt. Murud, path to summit: 1700 m, *Nooteboom & Chai 1936* (L).

33. XYRIDACEAE

33.1. Xyris

33.1.1. Xyris capensis Thunb. var. **schoenoides** (Mart.) Nilss.

Collection. Mt. Murud Camp V: 2100–2300 m, *Burtt & Martin B. 5484* (E).

34. ZINGIBERACEAE

34.1. Alpinia

34.1.1. Alpinia glabra Ridl.

Collections. Mt. Murud below Camp III: 1500–1600 m, *Burtt & Martin B. 5300* (E); Mt. Murud between Camps II and III: 1500 m, *Burtt & Martin B. 5221* (E).

34.1.2. Alpinia indet.

Collection. Mt. Murud, path to summit: 1800 m, *Nooteboom & Chai 1959* (L).

34.2. Amomum

34.2.1. Amomum anomalum R. M. Sm.

Collections. Mt. Murud below Camp III: 1500–1600 m, *Burtt & Martin B. 5303* (E); Mt. Murud near Camp III: 1800 m, *Burtt & Martin B. 5337* (E, L).

34.2.2. Amomum flavoalbum R. M. Sm.

Collection. Mt. Murud Camp III: 1800 m, *Burtt & Martin B. 5283* (E).

34.2.3. Amomum aff. **flavoalbum** R. M. Sm.

Collection. Mt. Murud Camp IV: 2000 m, *Burtt & Martin B. 5351* (E).

34.2.4. Amomum luteum R. M. Sm.

Collection. Mt. Murud below Camp IV: 1800 m, *Burtt & Martin B. 5372* (E).

34.3. Burbidgea

34.3.1. Burbidgea nitida Hook. f. [listed by Merrill (1928)].

Collection. Mt. Murud: *Mjöberg 122* (UC).

34.3.2. Burbidgea schizocheila Hackett

Collection. Mt. Murud below Camp III: 1500–1600 m, *Burtt & Martin B. 5314* (E).

34.4. Etlingera

34.4.1. Etlingera fimbriobracteata (K. Schum.) R. M. Sm.

Collection. Mt. Murud Camp III: 1800 m, *Burtt & Martin B. 5342* (E).

34.4.2. Etlingera longipetiolata (B. L. Burtt & R. M. Sm.) R. M. Sm.

Collection. Mt. Murud below Camp IV: 2000 m, *Burtt & Martin B. 5343* (E).

34.4.3. Etlingera aff. **muluensis** R. M. Sm.

Collection. Mt. Murud Camp III: 1800 m, *Burtt & Martin B. 5341* (E).

34.4.4. Etlingera pubescens (B. L. Burtt & R. M. Sm.) R. M. Sm.

Collection. Mt. Murud below Camp IV: 1800 m, *Burtt & Martin B. 5366* (E).

34.4.5. Etlingera punicea (Roxb.) R. M. Sm.

Collection. Mt. Murud Camp III: 1800 m, *Burtt & Martin B. 5279* (E).

34.5. Hedychium

34.5.1. Hedychium cylindricum Ridl. [listed by Merrill (1928) as *H. mjöbergii* Merr.].

Collections. Mt. Murud: 1900–2400 m, *Mjöberg 118* (UC, holotype of *H. mjöbergii* Merr.), 1900–2400 m, *121* (UC); Mt. Murud Camp IV: 2000 m, *Burtt & Martin B. 5382* (E).

34.5.2. Hedychium indet.

Collection. Mt. Murud, path to summit: 1700 m, *Nooteboom & Chai 1938* (L).

34.6. Hornstedtia

34.6.1. Hornstedtia incana R. M. Sm.

Collection. Mt. Murud Camp IV: 2000 m, *Burtt & Martin B. 5402* (E).

34.7. Plagiostachys

34.7.1. Plagiostachys bracteolata R. M. Sm.

Collection. Mt. Murud near Camp IV: 2000 m, *Burtt & Martin B. 5429* (E, K).

ANGIOSPERMS: DICOTYLEDONS

35. ACANTHACEAE

35.1. Strobilanthes

35.1.1. Strobilanthes indet.

Collection. Mt. Murud, path to summit: 1700 m, *Nooteboom & Chai 1933* (L).

36. ACTINIDIACEAE

36.1. Saurauia

36.1.1. Saurauia amoena Stapf

Collections. Mt. Murud: 1600 m, *Yii S. 44405* (K); Mt. Murud below Camp III: 1600 m, *Burtt & Martin B. 5294* (E); Mt. Murud/Belaban River headwaters: 1700 m, *Ilias S. 26303* (K).

37. ANACARDIACEAE

37.1. Toxicodendron

37.1.1. Toxicodendron borneense (Stapf) Gillis

Collections. Mt. Murud between 1st and 2nd summits: 2300 m, *Yii S. 44488* (K, SAR), 2200 m, *44612* (K, SAR); Mt. Murud summit ridge: 2300–2400 m, *Beaman 11454* (K, UNIMAS).

38. APIACEAE

38.1. Hydrocotyle

38.1.1. Hydrocotyle javanica Thunb.

Collection. Mt. Murud below Camp IV: 1800 m, *Burtt & Martin B. 5376* (E).

39. APOCYNACEAE

39.1. Alyxia

39.1.1. Alyxia oleifolia King & Gamble

Collection. Mt. Murud: 2200 m, *Nooteboom & Chai 2053* (L).

39.2. Leuconotis

39.2.1. Leuconotis eugenifolia (Wall. ex G. Don) A. DC. [listed by Merrill (1928) as *Leuconotis* sp.].

Collection. Mt. Murud: 1900 m, *Mjöberg 124* (UC).

40. AQUIFOLIACEAE

40.1. Ilex

40.1.1. Ilex harmsiana Loesn.

Collections. Mt. Murud: 2100 m, *Ilias S. 26453* (K, L), 2200 m, *Nooteboom & Chai 2020* (K, L), 2200 m, *2042* (L); Mt. Murud between 1st and 2nd summits: 2300 m, *Yii S. 44489* (K); Mt. Murud summit ridge: 2300–2400 m, *Beaman 11468* (K, UNIMAS).

40.1.2. Ilex havilandii Loes. [listed by Merrill (1928) as *I. confertifolia* Merr.].

Collections. Mt. Murud: 2200 m, *Nooteboom & Chai 2037* (L, SAR); Mt. Murud 2nd summit: 2300 m, *Yii S. 44425* (K, L); Mt. Murud Camp V: 2100–2300 m, *Burtt & Martin B. 5468* (E); Mt. Murud between 1st and 2nd summits: 2200 m, *Yii S. 44618* (K, L); Mt. Murud near summit: 2400 m, *Mjöberg 93* (UC, holotype of *I. confertifolia* Merr.); Mt. Murud summit ridge: 2300–2400 m, *Beaman 11444* (K, MSC, UNIMAS), 2300–2400 m, *11483* (K, UNIMAS).

41. ARALIACEAE

41.1. Arthrophyllum

41.1.1. Arthrophyllum collinum Philipson

Collections. Mt. Murud: 2300 m, *Ilias S. 26486* (L), 2200 m, *Nooteboom & Chai 2048* (L); Mt. Murud summit ridge: 2300–2400 m, *Beaman 11470* (K, MSC, UNIMAS).

41.2. Schefflera

41.2.1. Schefflera mjöbergii Merr. [listed by Merrill (1928)].

Collections. Mt. Murud: 1900 m, *Mjöberg 117* (UC, holotype of *S. mjöbergii* Merr.); Mt. Murud 2nd summit: 2000 m, *Ilias S. 26386* (K, SAR); Mt. Murud Camp III: 1700 m, *Burtt & Martin B. 5247* (E); Mt. Murud between 1st and 2nd summits: 2300 m, *Yii S. 44487* (K, SAR); Mt. Murud summit ridge: 2300–2400 m, *Beaman 11479* (K, MSC, UNIMAS); Mt. Murud, path to summit: 1800 m, *Nooteboom & Chai 1961* (L, SAR); Mt. Murud/Dapur River headwaters: 2100 m, *Ilias S. 26467* (SAR).

41.2.2. Schefflera aff. **remotiserrata** Merr.

Collection. Mt. Murud: 2200 m, *Nooteboom & Chai 2052* (L, SAR).

41.2.3. Schefflera sp.

Collections. Mt. Murud between 1st and 2nd summits: 2200 m, *Yii S. 44619* (K, L, SAR); Mt. Murud, Long Rapata/Ba Kelalan: 1700 m, *Ilias S. 26557* (K, L); Mt. Murud, path to summit: 1800 m, *Nooteboom & Chai 1958* (L, SAR).

42. ASCLEPIADACEAE

42.1. Dischidia

42.1.1. Dischidia nummularia R. Br.

Collection. Mt. Murud Camp III: 1700 m, *Burtt & Martin B. 5238* (E).

43. ASTERACEAE

43.1. Vernonia

43.1.1. Vernonia phanerophlebia Merr. var. **dulitensis** Koster

Collections. Mt. Murud: 2200 m, *Nooteboom & Chai 2017* (L); Mt. Murud Camp IV: 1900 m, *Burtt & Martin B. 5422* (E).

44. BALANOPHORACEAE

44.1. Balanophora

44.1.1. Balanophora papuana Schltr.

Collections. Mt. Murud: 2200 m, *Nooteboom & Chai 2034* (L); Mt. Murud between Camp V and summit: 2300 m, *Burtt & Martin B. 5447* (E).

44.1.2. Balanophora indet.

Collection. Mt. Murud, path to summit: 1800 m, *Nooteboom & Chai 1968* (L).

45. BEGONIACEAE

45.1. Begonia

45.1.1. Begonia murudensis Merr. [listed by Merrill (1928)].

Collection. Mt. Murud: 1900–2400 m, *Mjöberg 119* (UC, holotype of *B. murudensis* Merr.).

45.1.2. Begonia sp.

Collection. Mt. Murud, path to summit: 1700 m, *Nooteboom & Chai 1920* (L).

46. CAPRIFOLIACEAE

46.1. Viburnum

46.1.1. Viburnum hispidulum Kern

Collections. Mt. Murud between 1st and 2nd summits: 2200 m, *Yii S. 44621* (K); Mt. Murud summit: 2400 m, *Nooteboom & Chai 2061* (L).

47. CELASTRACEAE

47.1. Microtropis

47.1.1. Microtropis valida Ridl.

Collection. Mt. Murud, path to summit: 1800 m, *Nooteboom & Chai 1943* (L).

47.1.2. Microtropis wallichiana Wight ex Thwaites

Collection. Mt. Murud N of summit: 2300 m, *Nooteboom & Chai 2043* (L).

47.2. Perrottetia

47.2.1. Perrottetia alpestris (Blume) Loesn.

Collection. Mt. Murud: 1600 m, *Yii S. 44408* (K, L).

48. CLUSIACEAE

48.1. Garcinia

48.1.1. Garcinia indet.

Collections. Mt. Murud Camp IV: 2000 m, *Ilias S. 26394* (L); Mt. Murud summit: 2400 m, *Nooteboom & Chai 2010* (L); Mt. Murud, path to summit: 1700 m, *Nooteboom & Chai 1930* (L), 1800 m, *1964* (L); Mt. Murud/Belaban River: 1700 m, *Ilias S. 26317* (L), 1700 m, *S. 26320* (L), 1700 m, *S. 26322* (L), 1700 m, *S. 26333* (L), 1700 m, *S. 26342* (L).

49. CUNONIACEAE

49.1. Weinmannia

49.1.1. Weinmannia aphanoneura Airy Shaw

Collection. Mt. Murud summit ridge: 2400 m, *Burtt & Martin B. 5487* (E, SAR).

50. DAPHNIPHYLLACEAE

50.1. Daphniphyllum

50.1.1. Daphniphyllum glaucescens Blume subsp. **borneense** (Stapf) Huang

Collections. Mt. Murud above Camp IV: 2000 m, *Burtt & Martin B. 5423* (E); Mt. Murud/Belaban River: 1700 m, *Ilias S. 26315* (K), 1800 m, *S. 26365* (K).

51. DIPTEROCARPACEAE

51.1. Vatica

51.1.1. Vatica granulata Slooten subsp. **sabaensis** Ashton

Collections. Mt. Murud: 1600 m, *Yii S. 44403* (K); Mt. Murud/Belaban River: 1700 m, *Ilias S. 26312* (K).

51.1.2. Vatica indet.

Collection. Mt. Murud: 2400 m, *Nooteboom & Chai 2069* (L).

52. ELAEOCARPACEAE

52.1. Elaeocarpus

52.1.1. Elaeocarpus glaberrimus R. Knuth

Collections. MT. MURUD: 2100 m, *Ilias S. 26452* (K), 2100 m, *S. 26495* (K), 2300 m, *Yii S. 44427* (K); MT. MURUD NEAR CAMP V: 2100 m, *Ilias S. 26510* (K, L); MT. MURUD SUMMIT: 2400 m, *Nooteboom & Chai 2003* (L); MT. MURUD SUMMIT RIDGE: 2300–2400 m, *Beaman 11484* (K, UNIMAS).

52.1.2. Elaeocarpus murudensis Merr. [listed by Merrill (1928)].

Collections. MT. MURUD: 1900–2400 m, *Mjöberg 83* (BM, isotype; UC, holotype of *E. murudensis* Merr.), 2200 m, *Nooteboom & Chai 1976* (L); MT. MURUD BETWEEN 1ST AND 2ND SUMMITS: 2300 m, *Yii S. 44471* (K, L); MT. MURUD SUMMIT: 2400 m, *Nooteboom & Chai 2068* (K, L); MT. MURUD SUMMIT RIDGE: 2300–2400 m, *Beaman 11449* (K, MSC, UNIMAS).

52.1.3. Elaeocarpus nanus Corner subsp. **congestifolius** (R. Knuth) Coode

Collection. MT. MURUD SUMMIT: 2400 m, *Nooteboom & Chai 1986* (L).

52.1.4. Elaeocarpus sp. nov. aff. **glaberrimus** R. Knuth (fide Coode, pers. comm.)

Collection. MT. MURUD SUMMIT: 2400 m, *Nooteboom & Chai 1988* (L).

53. EPACRIDACEAE

53.1. STYPHELIA

53.1.1. Styphelia malayana (Jack) J. J. Sm.

Collections. MT. MURUD: 2100 m, *Ilias S. 26516* (K, L); MT. MURUD CAMP V: 2100–2300 m, *Burtt & Martin B. 5481* (E); MT. MURUD SUMMIT: 2400 m, *Nooteboom & Chai 2022* (L).

54. ERICACEAE

54.1. DIPLYCOSIA

54.1.1. Diplycosia acuminata Becc.

Collections. MT. MURUD CAMP III: 1800 m, *Burtt & Martin B. 5288* (E); MT. MURUD CAMP IV: 1900 m, *Burtt & Martin B. 5410* (E).

54.1.2. Diplycosia barbigera Sleumer

Collection. MT. MURUD/BELABAN RIVER: 1900 m, *Ilias S. 26373* (E, L, SAR).

54.1.3. Diplycosia fimbriata Sleumer

Collections. MT. MURUD 2ND SUMMIT: 2000 m, *Ilias S. 26384* (E, K, L); MT. MURUD ABOVE CAMP IV: 2000 m, *Burtt & Martin B. 5421* (E); MT. MURUD BETWEEN 1ST AND 2ND SUMMITS: 2300 m, *Yii S. 44478* (E, K, L); MT. MURUD SUMMIT: 2400 m, *Nooteboom & Chai 2002B* (L, SAR), 2400 m, *2063* (L); MT. MURUD SUMMIT RIDGE: 2300–2400 m, *Beaman 11457* (K, MSC, UNIMAS).

54.1.4. Diplycosia cf. **fimbriata** Sleumer

Collection. MT. MURUD ABOVE CAMP III: 2000 m, *Burtt & Martin B. 5266A* (E).

54.1.5. Diplycosia aff. **fimbriata** Sleumer

Collection. Mt. Murud SW of Camp IV: 2100 m, *Burtt & Martin B. 5358* (E).

54.1.6. Diplycosia microsalicifolia Argent

Collections. Mt. Murud above Camp IV: 2000 m, *Burtt & Martin B. 5419* (E); Mt. Murud between 1st and 2nd summits: 2300 m, *Yii S. 44493* (K); Mt. Murud, Dapur River headwaters: 2000 m, *Ilias S. 26447* (E, K, isotypes; SAR, holotype of *D. microsalicifolia* Argent).

54.1.7. Diplycosia punctulata Stapf

Collection. Mt. Murud 2nd summit: 2300 m, *Yii S. 44447* (E, K, SAR).

54.1.8. Diplycosia aff. **saurauioides** J. J. Sm.

Collections. Mt. Murud 2nd summit: 2000 m, *Ilias S. 26387* (L); Mt. Murud above Camp III: 2000 m, *Burtt & Martin B. 5267* (E), 2000 m, *5268* (E, SAR); Mt. Murud between 1st and 2nd summits: 2300 m, *Yii S. 44490* (E, K, SAR); Mt. Murud summit: 2400 m, *Nooteboom & Chai 1992* (K, L, SAR); Mt. Murud summit ridge: 2300–2400 m, *Beaman 11469* (K, MSC, UNIMAS).

54.1.9. Diplycosia cf. **scabrida** Becc.

Collection. Mt. Murud above Camp IV: 2000 m, *Burtt & Martin B. 5430* (E, SAR).

54.1.10. Diplycosia cf. **urceolata** Stapf

Collections. Mt. Murud: 2300 m, *Ilias S. 26487* (E, K); Mt. Murud 2nd summit: 2000 m, *Ilias S. 26381* (E, K, SAR), 2200 m, *S. 26416* (E, K, SAR), 2300 m, *Yii S. 44433* (K); Mt. Murud N side: 2300 m, *Burtt & Martin B. 5452* (E, SAR); Mt. Murud above Camp III: 2000 m, *Burtt & Martin B. 5266* (E, SAR).

54.1.11. Diplycosia indet.

Collections. Mt. Murud: 2200–2300 m, *Nooteboom & Chai 2056* (L); Mt. Murud above Camp III: 1800 m, *Burtt & Martin B. 5253* (E).

54.2. Rhododendron

54.2.1. Rhododendron borneense (J. J. Sm.) Argent, A. L. Lamb & Phillipps subsp. **villosum** (J. J. Sm.) Argent, A. L. Lamb & Phillipps [listed by Merrill (1928) as *R. cuneifolium* Stapf var. *subspathulatum* Ridl.].

Collections. Mt. Murud: 1900 m, *Mjöberg 98* (UC); Mt. Murud 2nd summit: 2200 m, *Ilias S. 26403* (K); Mt. Murud above Camp IV: 1800 m, *Burtt & Martin B. 5251A* (E); Mt. Murud between 1st and 2nd summits: 2300 m, *Yii S. 44460* (K, L).

54.2.2. Rhododendron burttii P. Woods

Collection. Mt. Murud above Long Rapata: 1700 m, *Burtt & Martin B. 5549* (E, holotype of *R. burttii* P. Woods).

54.2.3. Rhododendron buxoides Sleumer

Collections. MT. MURUD NEAR SUMMIT: 2300 m, *Nooteboom & Chai 1973* (K, isotype fragment; L, holotype of *R. buxoides* Sleumer); MT. MURUD SUMMIT: 2400 m, *Burtt & Martin B. 5446* (E).

54.2.4. Rhododendron crassifolium Stapf [listed by Merrill (1928) as *R. murudense* Merr.].

Collections. MT. MURUD: 1900 m, *Mjöberg 106* (L, fragment; UC, holotype of *R. murudense* Merr.); MT. MURUD SW OF CAMP III: 1700 m, *Burtt & Martin B. 5321* (E); MT. MURUD SUMMIT RIDGE: 2300–2400 m, *Beaman 11474* (K), 2300–2400 m, *11478* (K); MT. MURUD, PATH TO SUMMIT: 1800 m, *Nooteboom & Chai 1940* (L).

54.2.5. Rhododendron durionifolium Becc. [listed by Merrill (1928) as *R. mjöbergii* Merr.].

Collections. MT. MURUD: 2300 m, *Ilias S. 26493* (K, L), 1900–2400 m, *Mjöberg 105* (L, fragment; UC, holotype of *R. mjöbergii* Merr.); MT. MURUD ABOVE CAMP III: 1800 m, *Burtt & Martin B. 5264* (E); MT. MURUD SUMMIT: 2400 m, *Nooteboom & Chai 1989* (L); MT. MURUD SUMMIT RIDGE: 2300–2400 m, *Beaman 11447* (K, MSC, UNIMAS).

54.2.6. Rhododendron exuberans (Sleumer) Argent

Collection. MT. MURUD CAMP IV: 1800 m, *Burtt & Martin B. 5351A* (E).

54.2.7. Rhododendron himantodes Sleumer

Collection. MT. MURUD CAMP III: 1800 m, *Burtt & Martin B. 5251* (E).

54.2.8. Rhododendron micromalayanum Sleumer

Collections. MT. MURUD CAMP IV: 1900 m, *Burtt & Martin B. 5396* (E); MT. MURUD, LONG RAPATA/BA KELALAN: 1700 m, *Ilias S. 26555* (K); MT. MURUD, PATH TO SUMMIT: 1800 m, *Nooteboom & Chai 1955* (L).

54.2.9. Rhododendron moultonii Ridl.

Collection. MT. MURUD SUMMIT: 2400 m, *Nooteboom & Chai 2006* (L).

54.2.10. Rhododendron orbiculatum Ridl.

Collections. MT. MURUD BETWEEN 1ST AND 2ND SUMMITS: 2200 m, *Yii S. 44602* (K, SAR); MT. MURUD NEAR SUMMIT: 2300 m, *Nooteboom & Chai 1972* (L); MT. MURUD SUMMIT RIDGE: 2300–2400 m, *Beaman 11486* (K, MSC, UNIMAS); MT. MURUD, LONG RAPATA/BA KELALAN: 1700 m, *Ilias S. 26556* (K); MT. MURUD, PATH TO SUMMIT: 1900 m, *Nooteboom & Chai 1967* (L).

54.2.11. Rhododendron pneumonanthum Sleumer [listed by Merrill (1928) as *R. jasminiflorum* Hook.].

Collections. MT. MURUD: 2300 m, *Ilias S. 26492* (K, L), 1900–2400 m, *Mjöberg 103* (UC), 1900–2400 m, *104* (UC); MT. MURUD NEAR SUMMIT: 2400 m, *Nooteboom & Chai 1970* (L).

54.2.12. Rhododendron polyanthemum Sleumer

Collection. MT. MURUD SW OF CAMP III: 1700 m, *Burtt & Martin B. 5317* (E).

54.2.13. Rhododendron retivenium Sleumer

Collection. MT. MURUD BELOW CAMP III: 1600 m, *Burtt & Martin B. 5306* (E).

54.2.14. Rhododendron rugosum Low ex Hook. f.

Collection. MT. MURUD SUMMIT: 2400 m, *Burtt & Martin B. 5450* (E).

54.2.15. Rhododendron stenophyllum Hook. f. ex Stapf subsp. **angustifolium** (J. J. Smith) Argent, A. L. Lamb & Phillipps

Collection. MT. MURUD SW OF CAMP III: 1700 m, *Burtt & Martin B. 5322*(E)

54.2.16. Rhododendron yongii Argent

Collections. MT. MURUD: 2100 m, *Ilias S. 26462* (K); MT. MURUD SW OF CAMP IV: 2100 m, *Burtt & Martin B. 5365* (E).

54.2.17. Rhododendron sp. nov. ?

Collection. MT. MURUD SUMMIT RIDGE: 2300–2400 m, *Beaman 11441* (K, MSC, UNIMAS).

54.2.18. Rhododendron sp. (subsect. *Pseudovireya*)

Collections. MT. MURUD SUMMIT RIDGE: 2300–2400 m, *Beaman 11450* (E, K, UNIMAS), 2300–2400 m, *11467* (E, K, UNIMAS).

54.2.19. Rhododendron indet.

Collections. MT. MURUD: 2100 m, *Ilias S. 26464* (K); MT. MURUD SW OF CAMP IV: 2100 m, *Burtt & Martin B. 5363* (E); MT. MURUD ABOVE CAMP III: 1800 m, *Burtt & Martin B. 5250* (E), 1800 m, *B. 5255* (E); MT. MURUD/BELABAN RIVER: 1700 m, *Ilias S. 26363* (K).

54.3. VACCINIUM

54.3.1. Vaccinium cf. **bancanum** Miq.

Collections. MT. MURUD/BELABAN RIVER: 1700 m, *Ilias S. 26311* (K), 1800 m, *S. 26364* (K).

54.3.2. Vaccinium bigibbum J. J. Sm.

Collections. MT. MURUD 2ND SUMMIT: 2200 m, *Ilias S. 26420* (K); MT. MURUD SW OF CAMP III: 1700 m, *Burtt & Martin B. 5326A* (E); MT. MURUD/BELABAN RIVER: 1700 m, *Ilias S. 26310* (K).

54.3.3. Vaccinium cf. **bigibbum** J. J. Sm.

Collections. Mt. Murud Camp IV: 1400 m, *Ilias S. 26433* (K); Mt. Murud SW of Camp III: 1700 m, *Burtt & Martin B. 5323* (E).

54.3.4. Vaccinium claoxylon J. J. Sm.

Collections. Mt. Murud 2nd summit: 2300 m, *Yii S. 44437* (K, L); Mt. Murud Camp IV: 2000 m, *Ilias S. 26393* (K, L); Mt. Murud summit: 2400 m, *Nooteboom & Chai 1990* (L), 2400 m, *2005* (L); Mt. Murud summit ridge: 2300 m, *Burtt & Martin B. 5491* (E); Mt. Murud/Belaban River: 1700 m, *Ilias S. 26326* (K).

54.3.5. Vaccinium clementis Merr.

Collections. Mt. Murud: 2200 m, *Nooteboom & Chai 1975* (L); Mt. Murud 2nd summit: 2200 m, *Ilias S. 26410* (K, L), 2300 m, *Yii S. 44436* (K); Mt. Murud summit ridge: 2300–2400 m, *Beaman 11445* (K, MSC, UNIMAS).

54.3.6. Vaccinium moultonii Merr.

Collection. Mt. Murud, path to summit: 1800 m, *Nooteboom & Chai 1944* (L).

54.3.7. Vaccinium pachydermum Stapf [listed by Merrill (1928)].

Collections. Mt. Murud: 2100 m, *Ilias S. 26457* (K, L), 2300 m, *S. 26482* (K, L), 1900–2400 m, *Mjöberg 108* (K, UC); Mt. Murud 2nd summit: 2200 m, *Ilias S. 26414* (K, L); Mt. Murud between 1st and 2nd summits: 2300 m, *Yii S. 44476* (K, L); Mt. Murud summit: 2400 m, *Nooteboom & Chai 2002A* (L); Mt. Murud/Belaban River: 1900 m, *Ilias S. 26378* (K, L).

54.3.8. Vaccinium aff. **stapfianum** Sleumer

Collection. Mt. Murud Camp IV: 2000 m, *Ilias S. 26398* (K).

54.3.9. Vaccinium tenerellum Sleumer

Collections. Mt. Murud SW of Camp III: 1700 m, *Burtt & Martin B. 5323A* (E); Mt. Murud above Camp IV: 2000 m, *Burtt & Martin B. 5424* (E).

54.3.10. Vaccinium cf. **tenerellum** Sleumer

Collection. Mt. Murud Camp IV: 1900 m, *Burtt & Martin B. 5411* (E).

54.3.11. Vaccinium sp. 1 [listed by Merrill (1928)].

Collection. Mt. Murud: *Mjöberg 110* (UC).

54.3.12. Vaccinium sp. 2 [listed by Merrill (1928)].

Collection. Mt. Murud: *Mjöberg 109* (UC).

54.3.13. Vaccinium indet.

Collections. Mt. Murud Camp III: 1800–2000 m, *Burtt & Martin B. 5240* (E); Mt. Murud Camp IV: 1800 m, *Burtt & Martin B. 5349* (E); Mt. Murud SW of Camp IV: 2100 m, *Burtt & Martin B. 5362* (E).

55. ESCALLONIACEAE

55.1. Polyosma

55.1.1. Polyosma mjöbergii Merr. [listed by Merrill (1928); probably not distinct from *P. bracteosa* Stapf].

Collections. Mt. Murud: 2300 m, *Ilias S. 26489* (K, SAR), 1900–2400 m, *Mjöberg 107* (K, isotype; UC, holotype of *P. mjöbergii* Merr.); Mt. Murud 2nd summit: 2300 m, *Yii S. 44426* (K, L).

55.1.2. Polyosma sp. 1

Collections. Mt. Murud: 2200 m, *Nooteboom & Chai 2046* (L); Mt. Murud/Belaban River: 1900 m, *Ilias S. 26375* (E, K, SAR).

55.1.3. Polyosma sp. 2

Collection. Mt. Murud: 2000 m, *Ilias S. 26388* (E, K).

55.1.4. Polyosma indet.

Collection. Mt. Murud between 1st and 2nd summits: 2200 m, *Yii S. 44615* (SAR).

56. EUPHORBIACEAE

56.1. Austrobuxus

56.1.1. Austrobuxus nitidus Miq.

Collection. Mt. Murud/Ba Kelalan: 1700 m, *Ilias S. 26521* (SAR).

56.2. Homalanthus

56.2.1. Homalanthus grandifolius Ridl.

Collection. Mt. Murud, path to summit: 1700 m, *Nooteboom & Chai 1912* (L).

57. FABACEAE

57.1. Whitfordiodendron

57.1.1. Whitfordiodendron indet.

Collection. MT. MURUD RIDGE, SE SIDE: 1700–2000 m, *Beaman 11491* (K, MSC, UNIMAS).

58. FAGACEAE

58.1. LITHOCARPUS

58.1.1. Lithocarpus luteus Soepadmo

Collections. MT. MURUD/BELABAN RIVER: 1700 m, *Ilias S. 26336* (K, SAR), 1700 m, *S. 26325* (K).

58.2. QUERCUS

58.2.1. Quercus kinabaluensis Soepadmo

Collections. MT. MURUD NEAR SUMMIT: 2100 m, *Ilias S. 26508* (K, SAR), 2100 m, *Ilias S. 26515* (K, SAR).

58.2.2. Quercus valdinervosa Soepadmo

Collection. MT. MURUD/BELABAN RIVER: 1700 m, *Ilias S. 26330* (K).

59. GENTIANACEAE

59.1. GENTIANA

59.1.1. Gentiana borneensis Hook. f.

Collections. MT. MURUD: 2200 m, *Nooteboom & Chai 2047* (L); MT. MURUD CAMP V: 2100–2300 m, *Burtt & Martin B. 5457* (E).

60. GESNERIACEAE

60.1. AESCHYNANTHUS

60.1.1. Aeschynanthus magnificus Stapf [listed by Merrill (1928) as *Trichosporum mjöbergii* Merr.].

Collections. MT. MURUD: 1900 m, *Mjöberg 81* (UC), 1900 m, *89* (BM, isotype; UC, holotype of *Trichosporum mjöbergii* Merr.); MT. MURUD CAMP III: *Burtt & Martin B. 5226* (E); MT. MURUD BELOW CAMP III: 1500–1600 m, *Burtt & Martin B. 5312* (E).

60.1.2. Aeschynanthus parvifolius R. Br.

Collection. MT. MURUD CAMP III: 1800 m, *Burtt & Martin B. 5227* (E).

60.1.3. Aeschynanthus speciosus Hook.

Collection. MT. MURUD BELOW CAMP III: 1500–1600 m, *Burtt & Martin B. 5298* (E).

60.2. Agalmyla

60.2.1. Agalmyla tuberculata Hook. f.

Collections. Mt. Murud: 2400 m, *Nooteboom & Chai 2007* (L, SAR); Mt. Murud N side: 2100 m, *Burtt & Martin B. 5459* (SAR); Mt. Murud above Camp III: 1800 m, *Burtt & Martin B. 5249* (SAR).

60.3. Cyrtandra

60.3.1. Cyrtandra basiflora C. B. Clarke

Collection. Mt. Murud: 1600 m, *Yii S. 44414* (E).

60.3.2. Cyrtandra aff. **cuprea** B. L. Burtt

Collection. Mt. Murud near Camp III: 1800 m, *Burtt & Martin B. 5270* (E, SAR).

60.3.3. Cyrtandra dolichopoda B. L. Burtt

Collection. Mt. Murud below Camp III: 1600 m, *Burtt & Martin B. 5307* (E, SAR).

60.3.4. Cyrtandra horizontalis B. L. Burtt

Collection. Mt. Murud ridge, SE ridge: 1700–2000 m, *Beaman 11493* (K, MSC, UNIMAS).

60.3.5. Cyrtandra aff. **lacerata** B. L. Burtt

Collection. Mt. Murud below Camp III: 1600 m, *Burtt & Martin B. 5309* (E).

60.3.6. Cyrtandra aff. **pedicellata** B. L. Burtt

Collection. Mt. Murud below Camp IV: 1800 m, *Burtt & Martin B. 5377* (E).

60.3.7. Cyrtandra aff. **trisepala** C. B. Clarke

Collections. Mt. Murud: 1700 m, *Nooteboom & Chai 1914* (L), 1600 m, *Yii S. 44416* (E, L, SAR); Mt. Murud below Camp IV: 1800 m, *Burtt & Martin B. 5375* (E, SAR); Mt. Murud near Camp III: 1800 m, *Burtt & Martin B. 5280* (E).

60.3.8. Cyrtandra sp. (sect. *Decurrentes*)

Collection. Mt. Murud below Camp III: 1500–1600 m, *Burtt & Martin s.n.* (E).

60.4. Didymocarpus

60.4.1. Didymocarpus simplex Kraenzl.

Collections. Mt. Murud near Camp III: 1700 m, *Burtt & Martin B. 5246* (E); Mt. Murud near Camps III and IV: 1800–2000 m, *Burtt & Martin B. 5275* (E, SAR); Mt. Murud, path to summit: 1800 m, *Nooteboom & Chai 1950* (L).

60.4.2. Didymocarpus indet.

Collection. MT. MURUD: *Mjöberg 204 p.p.* [UC; specimen too imperfect to warrant identification beyond genus, fide Merrill (1928)].

60.5. LOXOCARPUS

60.5.1. Loxocarpus indet.

Collections. MT. MURUD BELOW CAMP III: 1500–1600 m, *Burtt & Martin B. 5313* (E, SAR); MT. MURUD NEAR CAMP III: 1800 m, *Burtt & Martin B. 5276* (E).

61. HYDRANGEACEAE

61.1. DICHROA

61.1.1. Dichroa febrifuga Lour.

Collections. MT. MURUD: 1600 m, *Yii S. 44422* (K); MT. MURUD CAMP IV: 1400 m, *Ilias S. 26421* (K); MT. MURUD NEAR CAMP III: 1800–2000 m, *Burtt & Martin B. 5308* (E).

62. ILLICIACEAE

62.1. ILLICIUM

62.1.1. Illicium cauliflorum Merr. [listed by Merrill (1928)].

Collections. MT. MURUD: 1900–2400 m, *Mjöberg 114* (UC, holotype of *I. cauliflorum* Merr.); MT. MURUD BELOW CAMP IV: 1800 m, *Burtt & Martin B. 5371* (E).

62.1.2. Illicium tenuifolium A. C. Sm.

Collection. MT. MURUD, PATH TO SUMMIT: 1700 m, *Nooteboom & Chai 1923* (L).

63. LAURACEAE

63.1. LINDERA

63.1.1. Lindera bibracteata (Blume) Boerl. var. **rufa** (Stapf) Kosterm.

Collections. MT. MURUD SUMMIT RIDGE: 2300–2400 m, *Beaman 11473* (K); MT. MURUD, PATH TO SUMMIT: 1800 m, *Nooteboom & Chai 1952* (L).

63.1.2. Lindera subumbelliflora (Blume) Kosterm.

Collection. MT. MURUD, PATH TO SUMMIT: 1900 m, *Nooteboom & Chai 1963* (L).

64. LOGANIACEAE

64.1. FAGRAEA

64.1.1. Fagraea blumei G. Don

Collection. MT. MURUD NEAR SUMMIT: 2200 m, *Nooteboom & Chai 1974* (L).

64.1.2. Fagraea oreophila Wong & Sugau [listed by Merrill (1928) as *F. obovata* Wall. in Roxb.].

Collections. MT. MURUD: 1900 m, *Mjöberg 94* (UC), *Yii S. 44474* (K); MT. MURUD SUMMIT: 2400 m, *Nooteboom & Chai 2011* (L).

64.2. GENIOSTOMA

64.2.1. Geniostoma rupestre Forst.

Collections. MT. MURUD: 2200 m, *Nooteboom & Chai 2051* (L); MT. MURUD CAMP IV: 2000 m, *Ilias S. 26397* (L).

65. LORANTHACEAE

65.1. HELIXANTHERA

65.1.1. Helixanthera cf. **cylindrica** (Jack) Danser

Collections. MT. MURUD BETWEEN 1ST AND 2ND SUMMITS: 2200 m, *Yii S. 44620* (SAR); MT. MURUD, PATH TO SUMMIT: 1900 m, *Nooteboom & Chai 1965* (L, SAR).

65.2. MACROSOLEN

65.2.1. Macrosolen cochinchinensis (Lour.) Tieghem

Collections. MT. MURUD SW OF CAMP IV: 2100 m, *Burtt & Martin B. 5364* (E); MT. MURUD SUMMIT: 2400 m, *Nooteboom & Chai 1977* (K, L).

65.2.2. Macrosolen flammeus Danser

Collection. MT. MURUD SUMMIT: 2400 m, *Nooteboom & Chai 2062* (L).

66. MELASTOMATACEAE

66.1. MEDINILLA

66.1.1. Medinilla crassifolia (Reinw. ex Blume) Blume

Collection. MT. MURUD: 1500 m, *Yii S. 44633* (AAU, fide G. Clausing, pers. comm.).

66.1.2. Medinilla homoeandra (Stapf) Nayar [listed by Merrill (1928) as *Anplectrum homoeandrum* Stapf].

Collection. MT. MURUD: 1900–2400 m, *Mjöberg 96* (K, UC).

66.2. Melastoma

66.2.1. Melastoma pulcherrimum Koord.

Collections. Mt. Murud: 2200 m, *Nooteboom & Chai 2024* (L); Mt. Murud Camp IV: 2000 m, *Ilias S. 26399* (K).

66.3. Phyllagathis

66.3.1. Phyllagathis brookei Nayar

Collections. Mt. Murud: 1900 m, *Ilias S. 26518* (L); Mt. Murud near Camp III: 1800 m, *Burtt & Martin B. 5278* (E).

66.4. Plethiandra

66.4.1. Plethiandra hookeri Stapf

Collections. Mt. Murud 2nd summit: *Ilias S. 26407* (K); Mt. Murud between 1st and 2nd summits: 2300 m, *Yii S. 44483* (K); Mt. Murud summit ridge: 2300–2400 m, *Beaman 11475* (K, MSC, UNIMAS).

66.5. Sarcopyramis

66.5.1. Sarcopyramis napalensis Wall.

Collections. Mt. Murud: 1600 m, *Yii S. 44411* (K, L); Mt. Murud below Camp III: 1600 m, *Burtt & Martin B. 5297* (E).

66.6. Sonerila

66.6.1. Sonerila crassiuscula Stapf

Collection. Mt. Murud summit: 2400 m, *Nooteboom & Chai 1982* (L); Mt. Murud summit ridge: 2300–2400 m, *Beaman 11460* (FLAS).

66.6.2. Sonerila macrantha Merr. [listed by Merrill (1928); probably not distinct from *S. tenuifolia* Blume].

Collections. Mt. Murud: 2300 m, *Ilias S. 26484* (L), 1900–2400 m, *Mjöberg 74* (NY, UC), 1900–2400 m, *75* (UC, holotype of *S. macrantha* Merr.), 1900–2400 m, *76* (UC), 1900–2400 m, *78* (UC); Mt. Murud 2nd summit: 2300 m, *Yii S. 44434* (SAR); Mt. Murud N side: 2300 m, *Burtt & Martin B. 5449* (E, SAR); Mt. Murud above Camp IV: 2000 m, *Burtt & Martin B. 5345* (E); Mt. Murud between Long Rapata and Camp III: 1500 m, *Burtt & Martin B. 5223* (E).

66.6.3. Sonerila nervulosa Ridl.

Collection. Mt. Murud near Camp III: 1800 m, *Burtt & Martin B. 5284* (E, SAR).

66.6.4. Sonerila pulchella Stapf

Collection. Mt. Murud ridge, SE side: 1700–2000 m, *Beaman 11494* (K).

66.6.5. Sonerila sp. ?

Collection. Mt. Murud: *Mjöberg 77* [UC; noted by Merrill (1928) to be a single imperfect specimen].

67. MORACEAE

67.1. Ficus

67.1.1a. Ficus deltoidea Jack var. **deltoidea**

Collections. Mt. Murud, path to summit: 1700 m, *Nooteboom & Chai 1916* (L); Mt. Murud/Paramusu River: 1500 m, *Yii S. 44646* (L).

67.1.1b. Ficus deltoidea Jack var. **intermedia** Corner

Collections. Mt. Murud: 2200 m, *Nooteboom & Chai 2028* (L); Mt. Murud Camp 4: 2000 m, *Ilias S. 26400* (K); Mt. Murud between 1st and 2nd summits: 2200 m, *Yii S. 44601* (K); Mt. Murud between Camp V and summit: *Burtt & Martin B. 5492* (E); Mt. Murud summit: 2400 m, *Nooteboom & Chai 2066* (L); Mt. Murud, path to summit: 1800 m, *Nooteboom & Chai 1957* (L).

67.1.1c. Ficus deltoidea var. **kinabaluensis** Corner

Collections. Mt. Murud: 2100 m, *Ilias S. 26450* (K); Mt. Murud 2nd summit: 2200 m, *Ilias S. 26417* (K); Mt. Murud Camp IV: 2000 m, *Ilias S. 26392* (K); Mt. Murud between Camp V and summit: *Burtt & Martin B. 5489* (E); Mt. Murud near Camp V: 2100 m, *Ilias S. 26514* (K); Mt. Murud summit: 2400 m, *Nooteboom & Chai 2001* (L).

67.1.2. Ficus oleaefolia King var. **valida** Corner

Collections. Mt. Murud Camp III: 2000 m, *Burtt & Martin B. 5254* (E); Mt. Murud between 1st and 2nd summits: 2200 m, *Yii S. 44604* (K); Mt. Murud/Belaban River: 1900 m, *Ilias S. 26376* (K).

67.1.3. Ficus recurva Blume var. **ribesioides** (Wall. ex Miq.) King

Collection. Mt. Murud, path to summit: *Nooteboom & Chai 1929* (L).

68. MYRICACEAE

68.1. Myrica

68.1.1. Myrica javanica Blume

Collections. Mt. Murud 2nd summit: 2000 m, *Ilias S. 26382* (L); Mt. Murud summit: 2400 m, *Anderson & Ilias S. 26477* (L), 2400 m, *Nooteboom & Chai 1994* (L).

69. MYRSINACEAE

69.1. Ardisia

69.1.1. **Ardisia lepidotula** Merr.

Collections. Mt. Murud Camp III: 1600 m, *Burtt & Martin B. 5261* (E); Mt. Murud, ridge SW of Camp IV: 2100 m, *Burtt & Martin B. 5353* (E).

69.1.2. **Ardisia mjöbergii** Merr. [listed by Merrill (1928)].

Collection. Mt. Murud: 1900–2400 m, *Mjöberg 80* (UC, holotype of *A. mjöbergii* Merr.).

69.1.3. **Ardisia obovatifolia** Merr. [listed by Merrill (1928)].

Collections. Mt. Murud: 1900–2400 m, *Mjöberg 79* (K, isotype; UC, holotype of *A. obovatifolia* Merr.); Mt. Murud, ridge above Camp IV: 1900 m, *Burtt & Martin B. 5412* (E).

69.1.4. **Ardisia virens** Kurz

Collection. Mt. Murud between Camps II and III: 1500 m, *Burtt & Martin B. 5222* (E).

69.1.5. **Ardisia** indet.

Collections. Mt. Murud: 2200 m, *Ilias S. 26496* (L); Mt. Murud summit: 2400 m, *Nooteboom & Chai 1978* (L); Mt. Murud, path to summit: 1700 m, *Nooteboom & Chai 1908* (L), 1700 m, *1913* (L), 1700 m, *1918* (L), 1700 m, *1919* (L).

69.2. Embelia

69.2.1. **Embelia minutifolia** Stapf

Collections. Mt. Murud above Camp IV: 2000 m, *Burtt & Martin B. 5346* (E); Mt. Murud between 1st and 2nd summits: 2200 m, *Yii S. 44609* (K, L), 2200 m, *44610* (K, L); Mt. Murud summit ridge: 2300–2400 m, *Beaman 11456* (K, UNIMAS); Mt. Murud/Belaban River: 1900 m, *Ilias S. 26379* (L).

69.2.2. **Embelia spiraeoides** Stapf

Collections. Mt. Murud, Dapur River headwaters: 2400 m, *Ilias S. 26532* (K, L); Mt. Murud, N side near Camp V: 2100 m, *Burtt & Martin B. 5445* (E).

69.2.3. **Embelia tortuosa** Stapf

Collections. Mt. Murud N side: 2100 m, *Burtt & Martin B. 5473* (E); Mt. Murud between 1st and 2nd summits: 2300 m, *Yii S. 44481* (K); Mt. Murud summit ridge: 2300–2400 m, *Beaman 11472* (K, MSC, UNIMAS).

69.2.4. **Embelia** indet.

Collections. Mt. Murud: 2200 m, *Ilias S. 26501* (L); Mt. Murud summit: 2400 m, *Nooteboom & Chai 2067* (L).

69.3. Maesa

69.3.1. Maesa indica A. DC.

Collection. Mt. Murud Camp III: 1800 m, *Burtt & Martin B. 5334* (E).

69.4. Myrsine

69.4.1. Myrsine cruciata (Philipson) Pipoly

Collections. Mt. Murud above Camp IV: 2100 m, *Burtt & Martin B. 5357* (E); Mt. Murud between 1st and 2nd summits: 2300 m, *Yii S. 44468* (K), 2300 m, *S. 44473* (K); Mt. Murud summit ridge: 2400 m, *Burtt & Martin B. 5490* (E).

70. MYRTACEAE

70.1. Baeckea

70.1.1. Baeckea taxifolia Merr. [listed by Merrill (1928)].

Collections. Mt. Murud: 2400 m, *Mjöberg 84* (UC, syntype of *B. taxifolia* Merr.), 2400 m, *111* (K, isosyntype; UC, syntype of *B. taxifolia* Merr.), 2200–2300 m, *Nooteboom & Chai 2016* (L); Mt. Murud, Camp V to summit: *Burtt & Martin B. 5493* (E).

70.2. Leptospermum

70.2.1. Leptospermum javanicum Blume [listed by Merrill (1928)].

Collections. Mt. Murud: 1500 m, *Mjöberg 92* (UC); Mt. Murud Camp IV: 1900 m, *Burtt & Martin B. 5425* (E); Mt. Murud near summit: 2100 m, *Ilias S. 26506* (L); Mt. Murud summit: 2400 m, *Anderson & Ilias S. 26480* (L), 2400 m, *Nooteboom & Chai 1983* (L); Mt. Murud summit ridge: 2300–2400 m, *Beaman 11442* (K, MSC, UNIMAS).

70.3. Syzygium

70.3.1. Syzygium aff. **ampullarium** (Stapf) Merr. & Perry

Collections. Mt. Murud: 2100 m, *Ilias S. 26458* (K, L); Mt. Murud 2nd summit: 2000 m, *Ilias S. 26385* (K, L), 2200 m, *S. 26406* (K, L), 2300 m, *Yii S. 44428* (K); Mt. Murud above Camp IV: 2100 m, *Burtt & Martin B. 5360* (E); Mt. Murud between 1st and 2nd summits: 2300 m, *Yii S. 44467* (K), 2300 m, *S. 44469* (K); Mt. Murud summit: 2400 m, *Anderson & Ilias S. 26472* (K, L), 2400 m, *Nooteboom & Chai 1984* (L), 2400 m, *1985* (L), 2400 m, *2012* (L); Mt. Murud summit ridge: 2300–2400 m, *Beaman 11446* (K, MSC, UNIMAS).

70.3.2. Syzygium castaneum (Merr.) Merr. & Perry

Collections. Mt. Murud Camp IV: 2000 m, *Ilias S. 26389* (K, L); Mt. Murud summit ridge: 2300–2400 m, *Beaman 11462* (K, MSC, UNIMAS); Mt. Murud/Belaban River: 1900 m, *Ilias S. 26380* (K, L).

70.3.3. Syzygium indet.

Collections. Mt. Murud, path to summit: 1700 m, *Nooteboom & Chai 1931* (L), 1800 m, *1941* (L); Mt. Murud/Belaban River headwaters: 1700 m, *Ilias S. 26308* (L).

70.4. Tristaniopsis

70.4.1. Tristaniopsis elliptica (Stapf) Peter G. Wilson & J. T. Waterh.

Collections. Mt. Murud near Camp V: 2100 m, *Ilias S. 26507* (K); Mt. Murud: 2300 m, *Ilias S. 26483* (K); Mt. Murud, path to summit: 1800 m, *Nooteboom & Chai 1966* (K, L).

70.4.2. Tristaniopsis indet.

Collection. Mt. Murud: 2200 m, *Nooteboom & Chai 2041* (L).

70.5. Xanthomyrtus

70.5.1. Xanthomyrtus flavida (Stapf) Diels

Collections. Mt. Murud: 2400 m, *Ilias S. 26534* (L); Mt. Murud summit: 2400 m, *Nooteboom & Chai 1997* (L); Mt. Murud, ridge above Camp IV: 1900 m, *Burtt & Martin B. 5401* (E).

70.5.2. Xanthomyrtus moultonii (Merr.) Merr.

Collection. Mt. Murud summit: 2400 m, *Nooteboom & Chai 2000* (L).

71. NEPENTHACEAE

71.1. Nepenthes

71.1.1. Nepenthes lowii Hook. f. [listed by Merrill (1928)].

Collections. Mt. Murud: *Mjöberg 115* (UC); Mt. Murud Camp V: 2100–2300 m, *Burtt & Martin B. 5477* (E); Mt. Murud near Camp III: 1800 m, *Burtt & Martin B. 5325* (E); Mt. Murud summit ridge: 2300–2400 m, *Beaman 11476* (K, UNIMAS); Mt. Murud, path to summit: 1900 m, *Nooteboom & Chai 1962* (L).

71.1.2. Nepenthes murudensis Culham ex Jebb & Cheek

Collections. Mt. Murud Camp IV: 2000 m, *Burtt & Martin B. 5427* (E); Mt. Murud Camp V: 2100–2300 m, *Burtt & Martin B. 5467* (E), 2100–2300 m, *B. 5471* (E); Mt. Murud between 1st and 2nd summits: 2200 m, *Yii S. 44623* (SAR); Mt. Murud near Camp V: 2100 m, *Ilias S. 26513* (SAR); Mt. Murud near summit: 2400 m, *Nooteboom & Chai 2035* (SAR); Mt. Murud summit ridge: 2300–2400 m, *Beaman 11461* (K, MSC, UNIMAS).

71.1.3. Nepenthes indet.

Collection. Mt. Murud: *Mjöberg 125* [UC; noted by Merrill (1928) to be only a detached inflorescence].

72. OLEACEAE

72.1. Chionanthus

72.1.1. Chionanthus enerve (Steenis) Kiew

Collections. Mt. Murud Camp V: 2100–2300 m, *Burtt & Martin B. 5478* (E); Mt. Murud between 1st and 2nd summits: 2200 m, *Yii S. 44617* (K, L); Mt. Murud summit ridge: 2300–2400 m, *Beaman 11451* (K, MSC, UNIMAS); Mt. Murud, N of summit: 2300 m, *Nooteboom & Chai 2049* (L).

72.2. Jasminum

72.2.1. Jasminum oreophilum Kiew

Collections. Mt. Murud Camp III: 1700 m, *Burtt & Martin B. 5234* (E); Mt. Murud/Belaban River: 1700 m, *Ilias S. 26324* (K).

73. PENTAPHRAGMATACEAE

73.1. Pentaphragma

73.1.1. Pentaphragma cf. **acuminatum** Airy Shaw

Collections. Mt. Murud SW of Camp III: 1700 m, *Burtt & Martin B. 5316* (E); Mt. Murud ridge, SE side: 1700–2000 m, *Beaman 11490* (K, MSC, UNIMAS).

73.1.2. Pentaphragma aurantiaca Stapf [listed by Merrill (1928) as *P. obtusifolium* Merr.].

Collections. Mt. Murud: 2300–2400 m, *Burtt & Martin B. 5451* (E), 2400 m, *Ilias S. 26537* (L), 1900 m, *Mjöberg 112* (UC, holotype of *P. obtusifolium* Merr.); Mt. Murud summit: 2400 m, *Nooteboom & Chai 2008* (L); Mt. Murud summit ridge: 2300–2400 m, *Beaman 11443* (K, MSC, UNIMAS).

73.1.3. Pentaphragma longisepalum Kiew

Collections. Mt. Murud Camp IV: 1900 m, *Burtt & Martin B. 5426* (E); Mt. Murud between Camps II and III: 1500 m, *Burtt & Martin B. 5225* (E).

74. PIPERACEAE

74.1. Peperomia

74.1.1. Peperomia laevifolia (Blume) Miq.

Collection. Mt. Murud near Camp III: 1800 m, *Burtt & Martin B. 5331* (E).

74.1.2. Peperomia indet.

Collection. Mt. Murud, path to summit: 1700 m, *Nooteboom & Chai 1924* (L).

74.2. Piper

74.2.1. Piper cf. **caninum** Blume

Collections. Mt. Murud below Camp III: 1600 m, *Burtt & Martin B. 5310* (E); Mt. Murud ridge, SE side: 1700–2000 m, *Beaman 11492* (K, UNIMAS).

75. POLYGALACEAE

75.1. Polygala

75.1.1. Polygala oreotrephes B. L. Burtt [listed by Merrill (1928) as *Polygala* sp.].

Collections. Mt. Murud: 1500 m, *Mjöberg 91* (UC), 2200 m, *Nooteboom & Chai 1971* (L); Mt. Murud near Camp III: 1800–2300 m, *Burtt & Martin B. 5324* (E).

76. RHAMNACEAE

76.1. Rhamnus

76.1.1. Rhamnus borneensis Steenis

Collections. Mt. Murud: 2300 m, *Ilias S. 26485* (K); Mt. Murud 2nd summit: 2200 m, *Ilias S. 26419* (K); Mt. Murud N side: 2100 m, *Burtt & Martin B. 5461* (E); Mt. Murud SW of Camp IV: 2100 m, *Burtt & Martin B. 5361* (E); Mt. Murud summit: 2400 m, *Nooteboom & Chai 1996* (K).

77. ROSACEAE

77.1. Prunus

77.1.1. Prunus arborea (Blume) Kalkman var. **densa** (King) Kalkman

Collections. Mt. Murud summit: 2400 m, *Nooteboom & Chai 1991* (L); Mt. Murud summit ridge: 2300–2400 m, *Beaman 11452* (K, MSC, UNIMAS); Mt. Murud, path to summit: 1900 m, *Nooteboom & Chai 1951* (L).

77.2. Rubus

77.2.1. Rubus alpestris Blume

Collection. Mt. Murud summit: 2400 m, *Nooteboom & Chai 1993* (L).

78. RUBIACEAE

78.1. Acranthera

78.1.1. Acranthera aff. **atropella** Stapf

Collections. Mt. Murud near Camp III: 1800 m, *Burtt & Martin B. 5336* (E); Mt. Murud ridge, SE side: 1700–2000 m, *Beaman 11488* (K, MSC, UNIMAS).

78.2. Argostemma

78.2.1. Argostemma borragineum Blume ex DC.

Collection. Mt. Murud: 1600 m, *Yii S. 44410* (K).

78.2.2. Argostemma hameliifolium Wernham

Collection. Mt. Murud: 1600 m, *Yii S. 44409* (K).

78.2.3. Argostemma moultonii Ridl. [listed by Merrill (1928) as *A. murudensis* Merr.].

Collections. Mt. Murud: 1900–2400 m, *Mjöberg 82* (K, isotype; UC, holotype of *A. murudensis* Merr.), 1900–2400 m, *88* (UC); Mt. Murud near Camp III: 1800 m, *Burtt & Martin B. 5326* (E); Mt. Murud, path to summit: 1700 m, *Nooteboom & Chai 1935* (L).

78.3. Cephaelis

78.3.1. Cephaelis stipulacea Blume [this species probably belongs in the genus *Chassalia*].

Collection. Mt. Murud near Camp III: 1800 m, *Burtt & Martin B. 5285* (E).

78.4. Discospermum

78.4.1. Discospermum abnorme (Korth.) S. J. Ali & Robbr.

Collection. Mt. Murud below Camp IV: 1800 m, *Burtt & Martin B. 5373* (E).

78.5. Hedyotis

78.5.1. Hedyotis pulchella Stapf

Collections. Mt. Murud below Camp III: 1600 m, *Burtt & Martin B. 5291* (E); Mt. Murud, Dapur River headwaters: 1900 m, *Ilias S. 26517* (K).

78.5.2. Hedyotis sp. 1

Collections. Mt. Murud: *Burtt & Martin B. 5448* (E), 2100 m, *Ilias S. 26465* (K, L).

78.5.3. Hedyotis indet.

Collection. Mt. Murud: 2200 m, *Nooteboom & Chai 2021* (L).

78.6. Ixora

78.6.1. Ixora sessililimba Merr. [listed by Merrill (1928)].

Collections. Mt. Murud: 1900–2400 m, *Mjöberg 116* (UC, holotype of *I. sessililimba* Merr.); Mt. Murud near Camp III: 1800 m, *Burtt & Martin B. 5340* (E).

78.7. Lucinaea

78.7.1. Lucinaea pentacme Stapf

Collections. Mt. Murud near Camp IV: 1900 m, *Burtt & Martin B. 5409* (E); Mt. Murud/Belaban River: 1900 m, *Ilias S. 26374* (K).

78.8. Ophiorrhiza

78.8.1. Ophiorrhiza aff. **fibrillosa** Ridl.

Collections. Mt. Murud: 1600 m, *Yii S. 44412* (K); Mt. Murud below Camp III: 1600 m, *Burtt & Martin B. 5296* (E).

78.9. Psychotria

78.9.1. Psychotria densifolia Stapf

Collections. Mt. Murud summit: 2400 m, *Nooteboom & Chai 1979* (L); Mt. Murud summit ridge: 2300–2400 m, *Beaman 11481* (K, MSC, UNIMAS).

78.9.2. Psychotria sp.

Collection. Mt. Murud, path to summit: 1700 m, *Nooteboom & Chai 1925* (L).

78.10. Rubia

78.10.1. Rubia cordifolia L.

Collection. Mt. Murud, path to summit: 1700 m, *Nooteboom & Chai 1926* (L).

78.11. Streblosa

78.11.1. Streblosa urticina Stapf

Collection. Mt. Murud near Camp III: 1800 m, *Burtt & Martin B. 5335* (E).

78.12. Timonius

78.12.1. Timonius esherianus W. W. Sm.

Collection. Mt. Murud, path to summit: 1700 m, *Nooteboom & Chai 1928* (L).

79. RUTACEAE

79.1. Euodia

79.1.1. Euodia indet.

Collection. Mt. Murud: 2200–2300 m, *Nooteboom & Chai 2050* (L).

80. SYMPLOCACEAE

80.1. Symplocos

80.1.1. Symplocos adenophylla Wall. ex G. Don var. **adenophylla**

Collections. Mt. Murud Camp IV: 1400 m, *Ilias S. 26434* (K); Mt. Murud/Belaban River headwaters: 1700 m, *Ilias S. 26306* (K, SAR), *S. 26352* (K), 1700 m, *S. 26353* (SAR).

80.1.2. Symplocos anomala Brand

Collection. Mt. Murud/Belaban River headwaters: 1700 m, *Ilias S. 26357* (L, SAR).

80.1.3. Symplocos henschelii (Moritzi) Benth. ex C. B. Clarke var. **henschelii** [listed by Merrill (1928) as *S. dolichantha* Merr.]

Collections. Mt. Murud: 1900–2400 m, *Mjöberg 120* (UC, holotype of *S. dolichantha* Merr.); Mt. Murud, path to summit: 1700 m, *Nooteboom & Chai 1932* (L).

80.1.4a. Symplocos laeteviridis Stapf var. **mjöbergii** (Merr.) Noot. [listed by Merrill (1928) as *S. mjöbergii* Merr.].

Collections. Mt. Murud: 1900–2400 m, *Mjöberg 97* (K, isotype; UC, holotype of *S. mjöbergii* Merr.); Mt. Murud, path to summit: 1500 m, *Nooteboom & Chai 1909* (K, L).

80.1.4b. Symplocos laeteviridis Stapf var. **pauciflora** Noot.

Collections. Mt. Murud: 2000 m, *Ilias S. 26391* (K, L), 1700–2000 m, *S. 26392* (?); Mt. Murud Camp IV: 1900 m, *Burtt & Martin B. 5389* (E); Mt. Murud/Belaban River: 1700 m, *Ilias S. 26334* (K, L).

80.1.5. Symplocos pendula Wight var. **hirtistylis** (Clarke) Noot.

Collections. Mt. Murud: *Nooteboom & Chai 2058* (K); Mt. Murud above Camp IV: 2000 m, *Burtt & Martin B. 5442* (E).

80.1.6. Symplocos tricoccata Noot.

Collection. Mt. Murud/Belaban River headwaters: 1700 m, *Ilias S. 26305* (K, L, SAR).

81. THEACEAE

81.1. Adinandra

81.1.1. Adinandra clemensiae Kobuski

Collections. Mt. Murud: 1600 m, *Yii S. 44499* (K); Mt. Murud between 1st and 2nd summits: 2200 m, *Yii S. 44611* (K).

81.1.2. Adinandra cf. **dumosa** Jack

Collection. Mt. Murud summit ridge: 2300–2400 m, *Beaman 11477* (K, MSC, UNIMAS).

81.2. Schima

81.2.1. Schima wallichii (DC.) Choisy subsp. **brevifolia** (Hook. f.) Bloemb.

Collections. Mt. Murud: 2200 m, *Nooteboom & Chai 2045* (L); Mt. Murud N side: 2100 m, *Burtt & Martin B. 5469* (E).

81.3. Ternstroemia

81.3.1. Ternstroemia beccarii Stapf

Collections. Mt. Murud: 2300 m, *Ilias S. 26490* (K), 2200 m, *Nooteboom & Chai 2031* (L); Mt. Murud 2nd summit: 2300 m, *Yii S. 44439* (K), 2300 m, *S. 44448* (K); Mt. Murud above Camp IV: 2000 m, *Burtt & Martin B. 5438* (E); Mt. Murud between 1st and 2nd summits: 2300 m, *Yii S. 44463* (L); Mt. Murud summit ridge: 2300–2400 m, *Beaman 11463* (K, MSC, UNIMAS); Mt. Murud, path to summit: 1800 m, *Nooteboom & Chai 1948* (L).

81.3.2. Ternstroemia denticulata (Pierre) Ridl.

Collections. Mt. Murud: 2200 m, *Ilias S. 26402* (L), 2100 m, *S. 26454* (L); Mt. Murud between 1st and 2nd summits: 2300 m, *Yii S. 44484* (K), 2300 m, *S. 44485* (K), 2200 m, *S. 44605* (K); Mt. Murud summit: 2400 m, *Nooteboom & Chai 1980* (L); Mt. Murud, path to summit: 1800 m, *Nooteboom & Chai 1956* (L).

81.3.3. Ternstroemia lowii Stapf

Collections. Mt. Murud above Camp IV: 2000 m, *Burtt & Martin B. 5436* (E); Mt. Murud summit ridge: 2300–2400 m, *Beaman 11453* (K, MSC, UNIMAS).

81.3.4. Ternstroemia indet.

Collection. Mt. Murud/Belaban River: 1700 m, *Ilias S. 26309* (L).

82. THYMELIACEAE

82.1. Wikstroemia

82.1.1. Wikstroemia brachyantha Merr.

Collections. Mt. Murud: 1600 m, *Yii S. 44420* (K); Mt. Murud below Camp IV: 1800 m, *Burtt & Martin B. 5374* (E).

82.1.2. Wikstroemia cf. **indica** (L.) C. A. Mey.

Collections. Mt. Murud: 2100 m, *Ilias S. 26459* (K, L); Mt. Murud N of summit: 2300 m, *Nooteboom & Chai 2038* (L), 2300 m, *2040* (L).

83. URTICACEAE

83.1. Elatostema

83.1.1. Elatostema acuminatum (Poir.) Brongn.

Collection. Mt. Murud below Camp III: 1600 m, *Burtt & Martin B. 5311* (E).

83.1.2. Elatostema cf. **lineare** Stapf

Collection. Mt. Murud, Camp III/Long Rapata: 1500 m, *Burtt & Martin B. 5224* (E).

83.1.3. Elatostema penibukanense Gibbs

Collections. Mt. Murud Camp III: 1800 m, *Burtt & Martin B. 5282* (E); Mt. Murud above Camp IV: 2000 m, *Burtt & Martin B. 5347* (E).

83.1.4. Elatostema sp. 1

Collections. Mt. Murud Camp IV: 1900 m, *Burtt & Martin B. 5386* (E); Mt. Murud above Camp III: 1800 m, *Burtt & Martin B. 5257* (E).

83.1.5. Elatostema sp. 2

Collection. Mt. Murud Camp IV: 1900 m, *Burtt & Martin B. 5387* (E).

83.1.6. Elatostema indet.

Collection. Mt. Murud summit: 2400 m, *Nooteboom & Chai 2059* (L).

83.2. Pilea

83.2.1. Pilea sp.

Collection. Mt. Murud below Camp IV: 1800 m, *Burtt & Martin B. 5367* (E).

84. VERBENACEAE

84.1. Clerodendrum

84.1.1. Clerodendrum kinabaluense Stapf

Collection. Mt. Murud Camp IV: 1900 m, *Burtt & Martin B. 5413* (E).

85. WINTERACEAE

85.1. Drimys

85.1.1. Drimys piperita Hook. f. [listed by Merrill (1928)].

Collections. Mt. Murud: *Mjöberg 101* (UC), *102* (UC), 2200 m, *Nooteboom & Chai 2018* (L); Mt. Murud Camp IV: 2000 m, *Burtt & Martin B. 5348* (E); Mt. Murud summit: 2400 m, *Nooteboom & Chai 2008A* (L); Mt. Murud summit ridge: 2300–2400 m, *Beaman 11458* (K); Mt. Murud, path to summit: 1700 m, *Nooteboom & Chai 1915* (L), 1800 m, *1949* (L).

INDEX TO NUMBERED COLLECTIONS CITED
[Collection-number prefixes have been omitted.]

(55.1.3); 26389 (70.3.2); 26391 (80.1.4b); 26392 (67.1.1c, 80.1.4b); 26393 (54.3.4); 26394 (48.1.1); 26397 (64.2.1); 26398 (54.3.8); 26399 (66.2.1); 26400 (67.1.1b); 26402 (81.3.2); 26403 (54.2.1a); 26406 (70.3.1); 26407 (66.4.1); 26408 (28.10.2); 26410 (54.3.5); 26414 (54.3.7); 26416 (54.1.10); 26417 (67.1.1c); 26419 (76.1.1); 26420 (54.3.2); 26421 (61.1.1); 26433 (54.3.3); 26434 (80.1.1a); 26447 (54.1.6); 26450 (67.1.1c); 26452 (52.1.1); 26453 (40.1.1); 26454 (81.3.2); 26455 (28.9.6); 26457 (54.3.7); 26458 (70.3.1); 26459 (82.1.2); 26462 (54.2.16); 26464 (54.2.19); 26465 (78.5.2); 26466 (28.14.1); 26467 (41.2.1); 26482 (54.3.7); 26483 (70.4.1); 26484 (66.6.2); 26485 (76.1.1); 26486 (41.1.1); 26487 (54.1.10); 26489 (55.1.1); 26490 (81.3.1); 26492 (54.2.11); 26493 (54.2.5); 26495 (52.1.1); 26496 (69.1.5); 26501 (69.2.4); 26505 (21.2.2); 26506 (70.2.1); 26507 (70.4.1); 26508 (58.2.1); 26510 (52.1.1); 26513 (71.1.2); 26514 (67.1.1c); 26515 (58.2.1); 26516 (53.1.1); 26517 (78.5.1); 26518 (66.3.1); 26519 (28.6.6); 26521 (56.1.1); 26532 (69.2.2); 26534 (70.5.1); 26537 (73.1.2); 26538 (28.10.2); 26539 (28.10.1); 26555 (54.2.8); 26556 (54.2.10); 26557 (41.2.3).

Mjöberg 7 (10.1.1); 22 (13.1.2); 49 (28.9.10); 52 (28.9.6); 64 (28.9.5); 66 (28.9.7); 67 (11.1.1); 68 (14.1.2); 70 (10.1.1); 71 (14.1.1); 73 (1.1.1, 1.1.3); 74 (66.6.2); 75 (66.6.2); 76 (66.6.2); 77 (66.6.5); 78 (66.6.2); 79 (69.1.3); 80 (69.1.2); 81 (60.1.1); 82 (78.2.3); 83 (52.1.2); 84 (70.1.1); 88 (78.2.3); 89 (60.1.1); 91 (75.1.1); 92 (70.2.1); 93 (40.1.2); 94 (64.1.2); 95 (5.1.1); 96 (66.1.2); 97 (80.1.4a); 98 (54.2.1a); 99 (21.1.1); 100 (21.2.1); 101 (85.1.1); 102 (85.1.1); 103 (54.2.11); 104 (54.2.11); 105 (54.2.5); 106 (54.2.4); 107 (55.1.1); 108 (6.1.1, 54.3.7); 109 (54.3.12); 110 (54.3.11); 111 (70.1.1); 112 (73.1.2); 113 (25.1.1); 114 (62.1.1); 115 (71.1.1); 116 (78.6.1); 117 (41.2.1); 118 (34.5.1); 119 (45.1.1); 120 (80.1.3a); 121 (34.5.1); 122 (34.3.1); 123 (30.1.1); 124 (39.2.1); 125 (71.1.3); 126 (23.1.2); 128 (23.1.3); 182 (12.1.1); 204 (3.1.1, 60.4.2); 214 (4.1.1); 256 (10.1.1).

Nooteboom & Chai 1906 (32.1.2); 1908 (69.1.5); 1909 (80.1.4a); 1910 (28.4.3); 1912 (56.2.1); 1913 (69.1.5); 1914 (60.3.7); 1915 (85.1.1); 1916 (67.1.1a); 1918 (69.1.5); 1919 (69.1.5); 1920 (45.1.2); 1922 (28.1.5); 1923 (62.1.2); 1924 (74.1.2); 1925 (78.9.2); 1926 (78.10.1); 1927 (28.12.4); 1928 (78.12.1); 1929 (67.1.3a); 1930 (48.1.1); 1931 (70.3.3); 1932 (80.1.3a); 1933 (35.1.1); 1934 (1.1.3); 1935 (78.2.3); 1936 (32.1.3); 1937 (22.1.1); 1938 (34.5.2); 1939 (29.1.1); 1940 (54.2.4); 1941 (70.3.3); 1943 (47.1.1); 1944 (54.3.6); 1945 (13.1.1a); 1946 (28.18.3); 1948 (81.3.1); 1949 (85.1.1); 1950 (60.4.1); 1951 (77.1.1a); 1952 (63.1.1a); 1954 (28.9.7); 1955 (54.2.8); 1956 (81.3.2); 1957 (67.1.1b); 1958 (41.2.3); 1959 (34.1.2); 1960 (8.1.1); 1961 (41.2.1); 1962 (71.1.1); 1963 (63.1.2); 1964 (48.1.1); 1965 (65.1.1); 1966 (70.4.1); 1967 (54.2.10); 1968 (44.1.2); 1969 (28.4.3, 28.4.1); 1970 (54.2.11); 1971 (75.1.1); 1972 (54.2.10); 1973 (54.2.3); 1974 (64.1.1); 1975 (54.3.5); 1976 (52.1.2); 1977 (65.2.1); 1978 (69.1.5); 1979 (78.9.1); 1980 (81.3.2); 1981 (25.2.1); 1982 (66.6.1); 1983 (70.2.1); 1984 (70.3.1); 1985 (70.3.1); 1986 (52.1.3a); 1987 (32.1.1); 1988 (52.1.4); 1989 (54.2.5); 1990 (54.3.4); 1991 (77.1.1a); 1992 (54.1.8); 1993 (77.2.1); 1994 (68.1.1); 1995 (28.9.9); 1995A (28.9.1); 1996 (76.1.1); 1997 (70.5.1); 1998 (23.1.1); 1999 (30.1.2); 2000 (70.5.2); 2001 (67.1.1c); 2002A (54.3.7); 2002B (54.1.3); 2003 (52.1.1); 2005 (54.3.4); 2006 (54.2.9); 2007 (60.2.1); 2008 (73.1.2); 2008A (85.1.1); 2009 (5.1.2); 2010 (48.1.1); 2011 (64.1.2); 2012 (70.3.1); 2013 (19.1.1); 2014 (11.1.1); 2015 (9.1.1); 2016 (70.1.1); 2017 (43.1.1a); 2018 (85.1.1); 2019 (28.6.2); 2020 (40.1.1); 2021 (78.5.3); 2022 (53.1.1); 2023 (25.3.1); 2024 (66.2.1); 2025 (26.1.1); 2026 (30.1.1); 2028 (67.1.1b); 2028a (17.1.1); 2029 (31.1.1); 2030 (25.1.3); 2031 (81.3.1); 2032 (28.8.3); 2033 (28.8.5); 2034 (44.1.1); 2035 (71.1.2); 2036 (9.1.1); 2037 (40.1.2); 2038 (82.1.2); 2039 (7.1.3); 2040 (82.1.2); 2041 (70.4.2); 2042 (40.1.1); 2043 (47.1.2); 2044 (28.11.1); 2045 (81.2.1a); 2046 (55.1.2); 2047 (59.1.1); 2048 (41.1.1); 2049 (72.1.1); 2050 (79.1.1); 2051 (64.2.1); 2052 (41.2.2); 2053 (39.1.1); 2054 (28.2.1); 2055 (28.6.8); 2056 (54.1.11); 2058 (80.1.5a); 2059 (83.1.6); 2061 (46.1.1); 2062 (65.2.2); 2063 (54.1.3); 2064 (15.1.1a); 2065 (28.12.2); 2066 (67.1.1b); 2067 (69.2.4); 2068 (52.1.2); 2069 (51.1.2).

Rena, Rantai et al. 60335 (28.13.1a); 60336 (28.12.4); 60394 (28.14.1).

Sarawak Museum Native Col 2937 (18.1.1).

Yii 44401 (28.1.5); 44402 (28.9.4); 44403 (51.1.1a); 44405 (36.1.1); 44408 (47.2.1); 44409 (78.2.2); 44410 (78.2.1); 44411 (66.5.1); 44412 (78.8.1); 44414 (60.3.1); 44416 (60.3.7); 44420 (82.1.1); 44421 (28.1.3); 44422 (61.1.1); 44425 (40.1.2); 44426 (55.1.1); 44427 (52.1.1); 44428 (70.3.1); 44430 (28.9.3); 44431 (28.12.2); 44432 (28.9.7); 44433 (54.1.10); 44434 (66.6.2); 44436 (54.3.5); 44437 (54.3.4); 44439 (81.3.1); 44442 (23.2.1); 44447 (54.1.7); 44448 (81.3.1); 44460 (54.2.1a); 44461 (19.1.1); 44463 (81.3.1); 44467 (70.3.1); 44468 (69.4.1); 44469 (70.3.1); 44471 (52.1.2); 44473 (69.4.1); 44474 (64.1.2); 44476 (54.3.7); 44478 (54.1.3); 44481 (69.2.3); 44482 (28.2.1); 44483

(66.4.1); 44484 (81.3.2); 44485 (81.3.2); 44486 (28.10.2); 44487 (41.2.1); 44488 (37.1.1); 44489 (40.1.1); 44490 (54.1.8); 44491 (28.12.3); 44493 (54.1.6); 44499 (81.1.1); 44601 (67.1.1b); 44602 (54.2.10); 44604 (67.1.2a); 44605 (81.3.2); 44608 (21.2.3); 44609 (69.2.1); 44610 (69.2.1); 44611 (81.1.1); 44612 (37.1.1); 44615 (55.1.4); 44616 (28.9.8); 44617 (72.1.1); 44618 (40.1.2); 44619 (41.2.3); 44620 (65.1.1); 44621 (46.1.1); 44623 (71.1.2); 44627 (28.10.1); 44633 (66.1.1); 44646 (67.1.1a).

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ADDENDUM

While this paper was in page proof we learned from J. J. Wood about two additional species of orchids collected on Mt. Murud by Burtt and Martin in 1967. These are added here, but data concerning number of taxa, taxon numbers, etc., have not been changed in the text.

ORCHIDACEAE

KUHLHASSELTIA

Kuhlhasseltia javanica J. J. Sm.

Collection. MT. MURUD NEAR CAMP IV: 1900 m, *Burtt & Martin B. 5408* (E).

ROBIQUETIA

Robiquetia pinosukensis J. J. Wood & A. L. Lamb

Collection. MT. MURUD CAMP II: 1700 m, *Burtt & Martin B. 5232* (E).